Corporate Responses to Climate Change Reporting Requirements in the UK

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King's College London

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Thesis Submitted for the degree of Doctor of Philosophy (Ph.D.)

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June 17, 2016

Abstract

UK-listed companies have multiple mandatory climate reporting requirements that aim to not only engage them in climate change, but also get them to take action beyond reporting. The thesis looks at the two latest mandatory requirements—'Mandatory Carbon Reporting', and 'Adaptation Reporting Power'—and discusses what they mean for business performance and management of climate change. To understand the rationales, practices, and impacts of climate reporting on organisational cultures and behaviours an extensive desktop review analysed websites and Annual reports of 176 companies listed either on the FTSE 100 or as one of the UK's critical infrastructure providers. This was supplemented by an intensive phase of 36 interviews with individuals representing 19 companies in one of four case-study sectors (e.g., Energy utility, Extractive, Financial service, Water); and an additional 24 third party conversations with Government officials, Regulators, Consultants, and Independent body organisations. It emerged that 93% of companies sampled regard climate change as meriting at least some engagement, with four levels of reporting identified, and a difference in the number of companies engaged in carbon reporting (93%) and adaptation reporting (28%). Rationales for climate reporting mirror those for wider social and environmental reporting. Companies report because of potential win-win outcomes, they are legitimacy seeking, and/or want to ensure auditability. However, reporting per se does not necessarily lead to corporate action on climate change. Instead there are economic, reputational, and regulatory factors, and sectoral characteristics (e.g., environmental sensitivity, energy intensity) that affect reporting's impact. This research has implications for the aims, designs and purposes of imposing reporting requirements to help business and society tackle climate change and the challenges presents. It contributes to a growing debate on the social implications of corporate reporting by highlighting the need to better understand what motivates businesses to not only disclose information, but also take action beyond reporting.

Acknowledgements

This research would not have happened without the support from the following people.

Great gratitude is due to David Demeritt for the trust he vested in me. You have not only guided me through this process but also looked after my wellbeing. When I first contacted you with my *very* brief précis I was astounded by how generous you were with your time and feedback, which have been ever-present. I will also never forget our first academic meeting. Where many supervisors may have asked an academic question you asked if I had joined the football club yet after remembering from our first conversation that I played. Thanks must also go to Henry Rothstein for your critical eye, challenging persona, and good humour.

I would also like to thank Suraje Dessai for planting the idea (whether good or bad) of pursuing a PhD in my head. Thank you also to James Porter and all the Project ICAD team I have met and shared conversations with; as well as Phil Hendy, Dominic Way, David Self, Lukasz Erecinski, Anne-Laure Beaussier, Maria Vinogradova, Maria Escobar, and Chris Bennett for allowing me to bounce ideas off you.

A special thank you must also go to Lisa Dilling, Roger Pielke Jr, and all the folks at the Center for Science and Technology Policy Research at the University of Colorado at Boulder (USA). You were more than welcoming and accommodating during my visit. I have so many great memories.

Also thanks to Briony Turner for being a top mate; Ronan Paugam for keeping me laughing, providing words of inspiration only you could provide, and coffee; Faith Taylor for the best Christmas advent calendar in the final few weeks of writing; the Hardman-Murphy's for your generosity and warmth; and Bill and Anne Delaney for putting a roof over my head and feeding me in the final stretch – Tiger lives on. Thanks also to Sebastien Nobert, Brandon Parkes, Josh Johnstone and all the folks I have shared K4L.04 with. If you failed in parting your wisdom on me, you made up for it in laughter and good memories.

On a more personal level I would like to thank my family, to whom this thesis is dedicated. Thank you to my Mum and Dad. You have provided a solid foundation and given me so many opportunities. You have encouraged me to follow my dreams and be the best I can be. For this I am ever grateful. To my brothers Michael and Joseph, and sister-in-law Jen, thank you for listening to my rants, your pep talks (that were largely based on movie plots), and for making me slow down occasionally. To Kane, Daisy, Bella, Florence, and Poppy, my four legged friends, you are the perfect walking companions in all weather conditions to clear the mind.

Finally, this thesis was funded by an Economic and Social Research Council (ESRC) studentship through King's Interdisciplinary Social Science Doctoral Training Centre (KISS-DTC). I am grateful to ESRC and KISS-DTC for the financial support that allowed me to undertake this research, as well as a thank you to KISS-DTC staff that have helped along the way. I would also like to thank everyone who participated in this study and shared his or her experiences and expertise with me.

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Chapter 1 Introduction

1.1 Setting the Scene

Corporate business organisations are an extremely influential entity in society and have long been recognised as important contributors to the common good. In fact, society and business organisations have a symbiotic relationship (Trodick, 2012). Society (its stakeholders') permits business organisations unique operating privileges so long as its needs and desires are served, whilst in return business organisations exploit society's demands to maximise profits for shareholders. An integral function in maintaining this relationship is the practice of corporate reporting – the public disclosure of corporate information on their business policies, strategies, operations, and performance (Crowther, 2012). Corporate reporting will help a company achieve corporate accountability with its stakeholders. That is, when a company reports corporate information, stakeholders in society can evaluate the effectiveness of the companies' past actions and expected outcomes of future actions to inform decision-making (Graham *et al.*, 2005; Crowther, 2012). Communicating effectively will help a company maintain its status quo with society, and in some instances can build trust and loyalty that enables business organisations to more easily satisfy demands to sustain its level of business performance.

There are two main types of corporate reporting: 'financial', and 'non-financial'. Financial reporting (which is the more tradition type of corporate reporting) is the measurement, processing, and communication of financial information about an organisation's actions (e.g., profit margins, asset liability, investment decisionmaking) (Ball and Foster, 1982; Stolowy and Lebas, 2002; Graham *et al.*, 2005; Jones, 2010; Crowther, 2012). By contrast, non-financial reporting delivers information on the social and environmental effects of the organisation's economic actions. This includes topics on employee wellbeing, respect for human rights, anticorruption and bribery, environmental governance and stewardship, and diversity in their board of directors (Azzone *et al.*, 1996; White, 1999; Wheeler and Elkington, 2001; Matten and Moon, 2008; Brammer *et al.*, 2012).

While both types of corporate reporting communicate corporate information they do so in different ways, and for different audiences. Whereas financial reporting is heavily regulated and has traditionally been inward-looking and explains past performance to shareholders and potential investors; non-financial reporting is largely voluntary and aligned with a more outward- and forward-looking perspective geared not only towards shareholders and investors, but also towards stakeholders such as employees and consumers (Jones, 2010; Crowther, 2012). The consequence of these differences has helped companies manage multiple stakeholder relationships across society through corporate reporting.

However, the number and frequency of ethical lapses and corporate malpractice has put the credibility and legitimacy of corporate reporting under scrutiny (O'Dwyer, 2002; McLaren, 2004; Staubus, 2005; Radley Yeldar, 2012). For example, Enron's dramatic collapse into bankruptcy in

2001 revealed the company's reported financial performance was sustained substantially by institutionalised, systematic, and creatively planned accounting fraud by its auditor Arthur Andersen (Petrick and Scherer, 2003; Duran, 2007; Li, 2010). This revelation had dramatic reputational and financial repercussions for Arthur Anderson who lost their status as one of the 'Big Five' accountancy firms, and have been prevented (by damage to its reputation) from returning as a viable business, though it still nominally exists (Li, 2010). Similarly, Volkswagen Group's recent violation of the United State's Clean Air Act has severely affected the reputation of the company and the automobile industry more generally (Hotten, 2015). The discovery that Volkswagen Group intentionally tampered and programmed some of their vehicles engines to meet US car emission standards during laboratory testing has had profound impacts on the company. Not only have share prices and reputation been damaged but also the company has had to pay massive fines. Furthermore, the credibility and legitimacy of their reporting practice, especially emissions data in Annual and Corporate Social Responsibility (CSR) reports, will be increasingly questioned.

These cases (like many others) raise the question about whether the information disclosed in corporate reporting is a true reflection of corporate activity. Evidence suggests that corporate reporting is not just about being transparent about business performance, but it is also an opportunity to create a favourable representation of the company. For some companies corporate reporting has been shown to be a corporate strategy to neutralise criticism, seek legitimacy for actions, and/or fulfil regulatory requirements (Deegan *et al.*, 2002; Laufer, 2003; Vos, 2009; Lyon and Maxwell, 2011; Radley Yeldar, 2012; Sullivan and Gouldson, 2012; Mahoney *et al.*, 2013; Stubbs *et al.*, 2013). Significantly, these suggested goals of corporate reporting have implications for the way in which society tackles contemporary issues like climate change where the business community has an important role to play (Okereke, 2007; Baglee *et al.*, 2012; Haslam *et al.*, 2014). Corporate reporting is typically the primary source of information on what and how a company is responding to climate change. Despite evidence of corporate climate action communicated by climate reporting, "the relentless upward trend in emissions presents something of a paradox" (Jones and Levy, 2007, p.429). Indeed, the rate of emission reductions made by the UK business community has slowed down. "Between 1990 and 2008, business sectors reduced greenhouse gas (GHG) emissions by 19% but just 4% of this reduction took place in the period 1999-2008" (Haslam *et al.*, 2014, p.204). This brings into question whether companies are actually operationalising and building climate change into their business strategy like they say they are in their climate reporting.

Like other forms of non-financial reporting (e.g., corporate social responsibility), climate reporting—the disclosure of corporate information on their activities to tackle and prepare for climate change—has experienced a sudden acceptance and uptake by business in the last decade. This is a stark contrast to the initial strong opposition displayed. Shortly after climate change became an important policy issue in the early 1990s corporate businesses were quick to engage in international debates in an effort to influence the direction and shape of regulation. For many years companies lobbied rigorously against international climate measures arguing uncertainties about the

economic, technological and strategic impact of any policy would not only be negative for their business but also for the global economy (Kolk and Pinkse, 2004; 2007; Eberlien and Matten, 2009; Gasbarro, 2013). Most notably, under the umbrella organisation 'Global Climate Coalition', US petroleum and automotive industries strongly opposed both legislative and regulative action on climate change for over a decade. However, this position slowly changed as companies realised climate policy was here to stay as an increasing number of National Governments supported the Kyoto Protocol, and the technological and economic outlook began to change (Dunn, 2002). Conscious of the inevitable knock-on effects, and an opportunity to influence regulation, companies started to look at the consequences of climate change for their business operations more deeply than before, and began to constructively engage with negotiations (Dunn, 2002).

Since, there has been a proliferation in climate reporting in the business community (Knox-Hayes and Levy, 2011; Sullivan and Gouldson, 2012; Varnäs *et al.*, 2013). The number of companies doing climate reporting has increased dramatically. For instance, the number of companies disclosing corporate climate information to the CDP's Climate Change Program (a voluntary climate reporting index) exponential grew from 221 respondents in 2003 to 1,971 in 2014 (CDP, 2003; 2014). This uplift in corporate climate reporting and wider engagement with climate change has been associated with various direct and indirect regulatory, reputational, economic, and physical risks and opportunities (Pfeifer and Sullivan 2008; Ihlen, 2009; Sullivan and Pfeifer, 2009; Ceres, 2010; Knox-Hayes and Levy, 2011; Amado *et al.*, 2012; Jira and Toffel, 2013; Nyberg and Wright, 2012; Sullivan and Gouldson, 2012; CDP, 2013a; Carbon Clear, 2014)

However, despite increases in climate reporting it is still argued that climate change is not universally accepted as a critical issue amongst business (and even the public at large) (Lorenzoni *et al.*, 2007; Nordberg, 2010; Hoffman, 2011; Poortinga *et al.*, 2011; Galbreath, 2014). Moreover, "investors have consistently criticised companies not providing information that can be readily used in investment decision-making" (Sullivan and Gouldson, 2012, p.60). Given these concerns, and the evidence for corporate reporting in general that companies are not necessarily providing true accounts of their business performance, it is an open question as to what purpose climate reporting serves companies. Understanding what purpose climate reporting serves organisations, and whether they are truthful accounts, is important because of the key role business has in helping society tackle climate change.

The business community is a key part of the fabric of global environmental governance (Levy, 2005; Jones and Levy, 2007). That is, how companies respond to contemporary environmental issues affects societies response. In regard to climate change, the business community has a major role to play in the way society mitigates and adapts to climate change. The actions of companies are not only part of the problem but are part of the solution. Companies are significant contributors of GHG emissions, and yet have the ability to cut their contribution dramatically, and have the financial and technological capacity to build climate resiliency (Jones and Levy, 2007; Patenaude, 2011; Linnenluecke and Griffiths, 2010; Amado *et al.*, 2012; Berkhout, 2012; Linnenluecke *et al.*, 2012; Gasbarro, 2013). If companies reduce their emissions, then society will be less impacted. At

the same time, companies are subject to climate risks and will have to respond to a "cascade of effects that move through the natural environment to impact the business environment. Climate effects (e.g., changes in the hydrological cycle) and physical effects (e.g., reduced water availability in some regions) trigger business effects (e.g., crops have insufficient water to grow in some regions)" (Network for Business Sustainability, 2011, p.2). All businesses, irrespective of size, location, products, and services depend on weather and climate. Changing conditions will affect the supply of resources, interrupt operations, and damage infrastructure and assets, among other direct and indirect impacts (Network for Business Sustainability, 2011; Amado *et al.*, 2012). This will in turn affect the ability of companies to continue providing an undisturbed service to society.

Therefore, how climate reporting thinking manifests itself within large and often complex corporate structures is an important issue to address. Studies have highlighted how social and environmental reporting has stuttered in changing business performance as companies have struggled to convert and integrate environmental, social and economic thinking into meaningful contexts for business functions. Instead, reporting has been a function to manage the corporate image, and meet Government requirements. The thesis aims to address these questions.

1.2 Research Aims and Objectives

The study of corporate responses to climate change is an evolving field of research. Academic and grey literature has looked at corporate responses to climate change in general (Kolk and Levy, 2001; Hoffman, 2002; Levy and Egan, 2003; Hoffman, 2004; 2005; Kolk and Hoffmann, 2007; Kolk and Pinkse, 2007; Lash and Wellington, 2007; Okereke *et al.*, 2009; Wittneben and Kiyar, 2009; Agrawala *et al.*, 2011; Gasbarro, 2013; Averchenkova *et al.*, 2015) and corporate climate reporting in particular (Jones and Levy, 2007; Kolk *et al.*, 2008; Okereke 2007; Okereke and Russel, 2010; Boiral *et al.*, 2011; Ford *et al.*, 2011; Knox-Hayes and Levy, 2011; Kauffmann *et al.*, 2012; Okereke *et al.*, 2012). Notably, this literature on corporate responses and climate reporting has largely focused on climate mitigation responses (e.g., strategies to reduce emissions, carbon disclosure practices) and carbon reporting. Only in recent years have scholars become more engaged in understanding climate adaptation responses (e.g., climate-related physical impacts on resilience frameworks, organisational resilience capacities) and adaptation reporting; and even then research engagement is limited because corporate adaptation is a relatively new practice (Ford *et al.*, 2011; Bierbaum *et al.*, 2013).

As yet, however, there has been no research comparing the two major types of climate reporting (e.g., carbon reporting and adaptation reporting) and their impacts on organisational culture and behaviour. Filling that gap in knowledge is one of the chief aims of this thesis. That is, the thesis aims to understand the affects of both carbon reporting and adaptation reporting on the performance and management of corporate business organisations. It will unearth factors that influence corporate decisions to implement climate mitigation and adaptation measures; what firms

perceived as relevant stimuli they might act upon; and where reporting is done. To examine this relationship three objectives, summarised in Table 1-a, will be performed.

Table 1-a: Summary of the research questions for each objective

Objective	Purpose	Research question(s)
One	To identify who reports, and determine what they are reporting about and for whom.	Who is reporting? How are they reporting? Where are they reporting
Two	To identify internal rationales and external drivers for reporting.	Why are they reporting?
Three	To identify how and why reporting affects decisions to act.	To what end does reporting meet?

Firstly the general patterns and approaches to climate reporting will be described. Objective One (Table 1-a) will identify the extent and content of climate reporting in the UK business community. In particular, it establishes who discloses climate information; what climate information is disclosed; and to whom climate information is disclosed. Understanding all of this will help determine normalised practices of climate reporting, and provide insight on corporate perspectives to climate change. Moreover the objective will address a void in knowledge. Previous studies have typically investigated how the business community addresses the causes of climate change (i.e., corporate climate mitigation and carbon reporting) and failed to give sufficient attention to how companies are dealing with the consequences of climate change (i.e., corporate climate adaptation and adaptation reporting) (Haigh and Griffths, 2012; Okereke *et al.*, 2012). Subsequently, the role and impact of the business community in building adaptive capacity and climate resilience (and contributing to maladaptation) is poorly understood. Of the research that has been conducted evidence indicates few companies have specifically evaluated climate adaptation options (Agrawala *et al.*, 2011; Archie *et al.*, 2012; Biagini and Miller, 2013; Averchenkova *et al.*, 2015). For example, it was found that less than half of FTSE 100 companies incorporated climate adaptation into their business strategy, despite 80% considering climate change a substantive risk to their business (CDP, 2012). Given this limitation and the fact climate reporting is an increasing corporate practice, it is important to distinguish what type of climate information is being disclosed (i.e., if adaptation reporting is happening alongside carbon reporting), and whether there are differences in disclosure because of type.

Secondly the rationales behind climate reporting will be explained. Objective Two (Table 1-a) will identify the internal and external motivations driving forward both corporate reporting practices of carbon reporting and adaptation reporting. In particular, it establishes why companies disclose different types of climate information (e.g., climate mitigation or climate adaptation) to determine whether decisions behind carbon reporting are similar or different to those for adaptation reporting. In addition, it determines whether decisions behind both types of climate

reporting are symptomatic of other forms of corporate non-financial reporting. Understanding this will contribute to existing discussions about the very purpose of corporate non-financial reporting, where questions have been raised about the nature of accountability and the notion of transparency, among other topics (Welford, 1997; Hoffman, 2005; Hess, 2007; Kolk, 2008). Studies indicate companies engage in non-financial reporting for multiple reasons. For some companies non-financial reporting is an avenue for business (economic) growth, where addressing their environment impact can open up new markets and stimulate technological innovation (Hajer, 1995; Murphy and Gouldson, 2000; Gouldson *et al.*, 2008; Korhonen, 2008). For other companies the practice of information disclosure is a tool to influence the perception of society and helps build brand equity in order to maximise profitability and shareholder returns. Reporting can be a means to distinguish themselves from their competitors by disclosing information on new or lowly reported practices (Deegan *et al.*, 2002; Laufer, 2003; Vos, 2009; Knox-Hayes and Levy, 2011; Lyon and Maxwell, 2011; Ascui and Lovell, 2012; Mahoney *et al.*, 2013). Whilst certain companies engage in social movements like CSR reporting if peers or closely associated industries are or have been targeted by interested parties to change behaviour (White, 1999; Wheeler and Elkington, 2001; Deegan, 2002; Reid and Toffel, 2009; Sullivan and Gouldson, 2012).

Thirdly corporate responses to climate change will be discussed. Objective Three (Table 1-a) will identify what climate measures companies are undertaking, and the factors influencing corporate decisions to implement such actions. Understanding this will help determine if the rhetoric of climate reporting is coupled or decoupled from climate measures (i.e., a true reflection of the actions taken). There is a general argument that reporting raises awareness in organisations to then decide whether to implement climate mitigation or adaptation measures (Arnell and Delaney, 2006; Bekhout *et al.*, 2006; Hoffman *et al.*, 2009; Ceres, 2010). Few studies have specifically examined this relationship. According to those that have, though companies are collecting data and reporting to various requirements and indexes, when it comes to taking action, not enough is being done. That is, despite extensive reporting the implementation of climate change activities is not widespread (Kolk and Hoffman, 2007; Carbon Clear, 2014). Few companies have incorporated the risks and opportunities associated with the physical effects of climate change into their business planning (Crawford and Seidel, 2013). This contradicts the idea (about disclosure) that "what gets measures, gets managed, and what gets disclosed gets done" (Ceres, 2010, p.33). Moreover, evidence indicates that while companies have embraced market-based solutions such as emissions trading and energy efficient technology (Dunn, 2002; Kolk and Pinkse, 2007; Ihlen, 2009), the implementation of climate adaptation measures (e.g., extensively installing new infrastructure to better cope with future weather and climate conditions) is rare (Agrawala *et al.*, 2011; Archie *et al.*, 2012; Biagini and Miller, 2013; Averchenkova *et al.*, 2015).

Developing a better understanding of this relationship—for both carbon reporting with mitigation measures, and adaptation reporting with adaptation measures—is important because climate responses of the business community are key to achieving domestic (and international) GHG emissions reduction targets and building climate resiliency (Patenaude, 2011; Amado *et al.*,

2012). Companies are both part of the problem (e.g., emit emissions, and are highly vulnerable to weather-related physical impacts and climate regulation) and part of the solution (e.g., have the financial and technological resources to cause meaningful change) (Sullivan, 2008; Borial *et al.*, 2012; Baglee *et al.*, 2012; Jira and Toffel, 2012; Okereke *et al.*, 2012; Biagini and Miller, 2013). It is impossible to achieve goals without their involvement since business is credited with contributing 77% of the UK's total GHG emissions during 1990-2008 (Haslam *et al.*, 2014). If companies are reporting in isolation from implementing mitigation and adaptation measures the repercussions will be severe. Failure by the business community to address their emissions will accelerate the rate of climate change, and decisions to not build climate resilience may amplify impacts.

Findings from this objective will provide policymakers with additional insight into what motivates companies to not only engage in climate change (and the need to plan), but also to take action. This will ultimately aid climate policy, and other forms of corporate regulation. Moreover, given the amount of climate regulation companies are obligated to respond to, findings will contribute to wider discussions looking at the role and effectiveness different modes of governance play in influencing corporate decisions to do more than just comply.

1.3 Thesis Outline

The thesis is organised as follows. Chapter 2 introduces the theoretical concepts that underpin the research in this thesis. In particular it focuses on some of the organisational reporting perspectives behind corporate social and environmental reporting that may or may not influence the practice of climate reporting in business. For each perspective a clear definition is developed, and it is distinguished from other strategies. Chapter 3 delineates the research methodology employed in the study. A desktop review of corporate websites, Annual reports, and CSR reports; and semi-structured interviews were undertaken with company employees to explore motivations to report, practices of reporting, and impacts of reporting. In addition, third party conversations will be performed to make sense of new phenomena when little is known (McKeown, 2004). This section describes the way in which the desktop review, interviews, and conversations will be carried out and how data is analysed, with particular attention to the relationship between theory and data. Chapter 4 presents an overview of domestic climate policy in the UK and its relationship with the business community. It focuses on the emergence of the Climate Change Act 2008 and different climate reporting requirements the business community is subject to. Chapter 5 distils some of the patterns and discourses of climate reporting in the UK business community. It highlights that there are different degrees of disclosure, sectoral variation, and three dominant discourses of climate reporting. Chapter 6 and 7 discuss the corporate practice of carbon reporting and adaptation reporting respectively. Both chapters follow the same outline. In separate sections the rationales, practices, and impacts of reporting are introduced and examined. After which the relationship between rhetoric and reality is discussed. This section reviews the connections between rationales, approaches, and impacts of reporting, and examines what reporting means for business

performance. Chapter 8 synthesises and compares the findings of Chapter 6 and 7, along with consideration of the implications of these findings for corporate climate reporting specifically, and corporate non-financial reporting generally.

Chapter 2 Literature Review

2.1 Introduction

In order to explore how carbon reporting and adaptation reporting affect organisational cultures and behaviours this chapter introduces the theoretical concepts that underpin the thesis. The chapter is split into two sections. Section one explains how both financial and non-financial forms of corporate reporting are grounded in the principles of accounting – the measurements and quantification of corporate performance. Section two will then explore some of the theories of organisational management that have put forward to explain corporate reporting practices. In particular, it will discuss, in separate sub-sections, three of the most commonly used perspectives for analysing corporate social and environmental reporting – ecological modernisation, greenwashing, and audit culture. Each sub-section will develop a clear definition for each perspective, and explain how it has influenced organisational culture and behaviour. Finally, the chapter closes with a summary of the main points.

2.2 Accounting and Corporate Reporting

Corporate business organisations did not always disclose such a variety of information. Historically corporate reporting was purely a technical economic practice identifying, measuring and communicating financial information about profit and loss for the benefit of shareholders and potential investors (Cormier and Gordon, 2001; Burritt *et al.*, 2002; Bebbington and Thomson, 2007). This conventional form of accounting, based upon Luca Pacioli's 1494 double-entry book keeping, focuses on profitability (Jones, 2010; Crowther, 2012). In essence it aims to ensure that companies squeeze a surplus (profit) from their ongoing exchange activities. "By explicitly placing 'profits' on a 'dias' conventional accounting elevates the measurement, calculation, valuation, and disclosure of financial assets and profit. Other activities which remain unmeasured are disregarded" (Jones, 2010, p.129). That is, accounting takes a very narrow business-orientated view, focusing on measuring monetary transactions and not considering wider, un-monetised interactions with or between society and nature. This orientation has, in some instances, led to companies causing ecological destruction as the environment is sacrificed for profit (Maunders and Burritt, 1991; Kovel, 2007).

Developments in science, politics and media, and the accumulation of visible damage made the public more conscious and more concerned about how companies operated, creating new social pressures that affected their ability to operate (Burritt *et al.*, 2002). In response, pioneering companies began to integrate social and environmental risks, opportunities, and impacts into their corporate governance (and reporting) practices as a way to manage those social pressures, and in some instances enhance their reputation as a socially responsible entity (Brammer *et al.*, 2012; Mahoney *et al.*, 2013). This occurs because external stakeholders assume that companies disclosing

social and environmental information alongside information on economic performance are providing a more comprehensive picture of their activity and are therefore more accountable for it. This transparency, in turn, allows external stakeholders to evaluate corporate activities and to take them into account in their own decision-making about the firm (Halme and Huse, 1997; White, 1999; Wheeler and Elkington, 2001; Deegan, 2002; Brown *et al.*, 2009a). Under this pretext social and environmental reporting—which is often labelled 'Corporate Social Responsibility' (CSR), 'Corporate Responsibility', 'Sustainability', or 'Triple Bottom Line' reporting—has "transformed from a fringe activity pioneered by socially conscious but non-mainstream companies into a credible and serious practice embedded by a number of major corporations" (Wheeler and Elkington, 2001, p.4). Today just shy of 8,700 organisations from over 60 countries[1] are known to be doing social and environmental reporting (as indicated by their participation in GRI's sustainability reporting network[2]), with some 93% of the world's largest 250 corporations reporting on their sustainability performance (GRI, 2015).

Central to social and environmental reporting are the accountancy principles of financial reporting (Azzone *et al.*, 1996; Adams and Zutshi, 2004; Matten and Moon, 2008; Brammer *et al.*, 2012). That is, social and environmental information is objectified and quantified into metrics that can be used to appraise corporate activities and drive social and environmental management and organisational learning (Burchell *et al.*, 1985; Bebbington and Thomson, 2007; Andrew and Cortese, 2011a; 2011b; Lovell and MacKenzie, 2011). Accounting, in this sense, is used broadly as an overriding measurement system rather than for capturing the purely monetary aspects of a business (Jones, 2010).

However, the application of accountancy principles in social and environmental reporting has not been seamless. Six impediments—capitalist orientation; business focus; reliance on neoclassical economics; numerical quantification; monetary dependence; and technical accounting practices—inhibit the suitability of accountancy principles in social and environmental reporting (for a full explanation of each impediment see Jones, 2010). For example, differences in periodicity make for an uneasy marriage between accounting and the environment, whereby more favourable short-term management strategies (that appease financial markets and shareholders) do not fully take into account the long-term impact of environmental issues (Burritt *et al.*, 2002; Hopwood, 2009; Jones, 2010). As such, existing approaches to environmental costing (which are based on traditional financial accounting) ignore many of the indirect consequences of corporate actions on the environment (Hopwood, 2009).

What's more, unlike conventional financial accounting, social and environmental reports are not developed by one departmental team. Instead, multiple actors from several departments are

[1] http://database.globalreporting.org/, [Accessed December 1, 2015].

[2] GRI is a network and framework designed to help promote sustainability in companies by enabling them to communicate social and environmental information clearly and consistently to a range of external stakeholders, including consumers, investors, potential employees, environmentalists, not-for-profit organizations, suppliers, governments, and other businesses, among others.

typically involved in producing sub-reports that are then stitched together to form an overall report. Although this ostensibly provides a broader more in-depth picture, different business units often used different set of measurements that reflect the different processes and values they place on social and environmental risks, opportunities and impacts. As a result, this non-systematic collection of information leads to a complex and heterogeneous reports that do not necessarily produce information readily useful or usable for shareholders for their decision-making (Burritt *et al.*, 2011).

Nonetheless, despite these difficulties with applying accounting methods to social and environmental reporting, the accounting principles of relevance, completeness, consistency, transparency, and accuracy have been widely employed in climate change reporting (e.g., Greenhouse Gas Protocol[3]), as national and international climate policymaking places greater emphasis upon them (Hopwood, 2009; Andrew and Cortese, 2011a; 2011b; Lovell and MacKenzie, 2011). Like its association in social and environmental reporting, accounting is perceived to make climate risks, opportunities and impacts more quantifiable and thus manageable for a business, by enabling them to identify specific actions and more general strategies to mitigate causes (e.g., reduce carbon emissions) (Okereke, 2007; Lovell and MacKenzie, 2011) and build adaptive capacity[4]. Accounting also allows others to see those actions and to hold business accountable for them.

However, the role and effectiveness of climate accounting is contested. Specifically, calculating emissions in all business functions (e.g., supply chain) is not fully developed (Sullivan and Gouldson, 2012); there is scepticism about strategic "in-house" development of reporting standards (Beder, 2000, p.29); many companies have relatively immature reporting experience; and due to the availability of multiple reporting methodologies, comparability of information for external end-users is complex (Pfeifer and Sullivan, 2008; Andrew and Cortese, 2011a; 2011b). Furthermore, climate change is a unique issue plagued by omnipresent and inherent uncertainty. Not only are the effectiveness of business strategies uncertain but the science that underpins those decisions is also uncertain and contested (Frame *et al.*, 2007; Stainforth *et al.*, 2007; Wilby and Dessai, 2010; Suckling and Smith, 2013; Smith *et al.*, 2015). In fact the timing, degree and impact of climate change remains uncertain despite our best efforts and scientific advances (Demeritt and Langdon, 2004; Gawith *et al.*, 2009; Arnell, 2011). Climate change policymaking and decision-making is further complicated by a host of contextual and intrinsic barriers including: the usability of climate science for decision making; communication difficulties; the quantity and variety of information available to inform; poor understanding of stakeholders needs; and a lack of clarity about what adaptation response actions are, amongst others (Dilling, 2007; Sarewitz and Pielke Jr, 2007; Eden, 2011; Clar *et al.*, 2012; Tang and Dessai, 2012).

[3] The Greenhouse Gas Protocol is an internationally accepted set of GHG accounting and reporting standards for business (Andrew and Cortese, 2011a; 2011b)

[4] Adaptive capacity is "the ability of a system to adjust to climate change, including climate variability and extremes, to moderate potential damages, to take advantage of opportunities, or to cope with the consequences" (Burton *et al.*, 2002, p.150)

Thus there are important questions over why companies would really want to engage in climate reporting, and what impacts it may have business activities. There is a growing literature looking at corporate responses to climate change in general (Kolk and Levy, 2001; Hoffman, 2002; Levy and Egan, 2003; Hoffman, 2004; 2005; Kolk and Hoffmann, 2007; Kolk and Pinkse, 2007; Okereke *et al.*, 2009; Agrawal *et al.*, 2011; Gasbarro, 2013; Averchenkova *et al.*, 2015) and corporate climate reporting in particular (Jones and Levy, 2007; Kolk *et al.*, 2008; Okereke 2007; Okereke and Russel, 2010; Boiral *et al.*, 2011; Ford *et al.*, 2011; Knox-Hayes and Levy, 2011; Ascui and Lovell, 2012; Kauffmann *et al.*, 2012; Okereke *et al.*, 2012). As yet, however, there has been no research comparing the two major types of climate reporting (i.e., carbon and adaptation) and their impacts on organisational culture and behaviour. Filling that gap in knowledge is one of the chief aims of this thesis. To that end, the chapter now discusses different theories of organisational management that have been used to investigate how social and environmental reporting influences organisational culture and behaviour.

2.3 Theories of Organisational Management

There is extensive research on the factors that influence organisations to disclose environmental, social and economic information. Some of the most common drivers include: gaining a competitive advantage, complying with legislation, meeting stakeholder expectations, improving brand equity, building trust, and enhancing perceived legitimacy amongst stakeholders (Adams and Zutshi, 2004; Haniffa and Cooke, 2005; Okereke, 2007; Hassan and Ibrahim, 2012). To account for these drivers three theories have been widely used to explain behavioural differences in information disclosure between firms. The first, stakeholder theory, seeks to explain environmental disclosure in terms of the impact of stakeholder interests; the second, legitimacy theory, focuses on explaining the impact of social and political pressure on a company's level of disclosure; and the third, political economy theory studies the interplay of power, the goals of power wielders and the productive exchange system) (Gray *et al.*, 1995; Cormier and Gordon, 2001; Deegan, Rankin and Tobin, 2002; Hassan and Ibrahim, 2012).

While differences exist between the three theories it has been argued that stakeholder and legitimacy theory "are better seen as two (overlapping) perspectives on the issue which are set within a framework of assumptions about "political economy"" (Gray *et al.*, 1995, p.52). Consequently, the theories can be conceptualised as "differences in levels of resolution of perception rather than arguments for and against competing theories as such" (Gray *et al.*, 1995, p.52). To that end, it is possible to associate and integrate these theories into three broader organisational reporting perspectives that influence corporate responses to contemporary social and environmental issues. More specifically, one perspective is guided by corporate self-interest; a second perspective is driven by a desire to shape external stakeholders opinion; and a third perspective is reactive to the conditions of the state and society. Each organisational reporting

perspective will have consequences and implications for society's response to contemporary social and environmental issues like climate change.

The chapter will now introduce these three perspectives, discussing how they shape corporate social and environmental reporting in general, and hypothesising how they may shape corporate climate reporting. At this junction it is important to note that the purpose of this thesis is not to discuss which perspective is right; rather the aim is to discuss how each perspective influences the UK business community to report on climate change.

2.3.1 Reporting due to corporate self-interest

The 1970s-80s wave of environmentalism brought into question the traditional pragmatist style of policymaking for environmental issues such as pollution, which in the form first of Acid Rain and then of climate change raised questions about whether and how development could be made more sustainable. Not only was negligence of the environment seen as morally wrong but it was also seen as grossly inefficient (Hajer, 1993; Hajer, 1995). In fact for many stakeholders environmental management had become a non-negotiable practice that should be integrated into the overall process of societal modernisation (Hajer, 1993; Gibbs, 2000). One concept that epitomised this new attitude towards environmental politics was 'ecological modernisation', which focused on harmonising the relationship between ecological protection and industrial production through 'super-industrialisation' rather than de-industrialisation (Simonis, 1989; Spaargaren and Mol, 1992; Gibbs, 2000; Murphy and Gouldson, 2000; Gouldson *et al.*, 2008; Mol *et al.*, 2009). More specifically, for the eco-modernist, economic growth can be made more consistent by protecting the environment through prevention-based policymaking that conceptualises negative environmental impacts as problems of business inefficiency. Reconciling economic growth and environmental protection in this way promises also to open up new markets and stimulate technological innovation (Hajer, 1995; Murphy and Gouldson, 2000; Gouldson *et al.*, 2008; Korhonen, 2008). For eco-modernists protection of the environment is portrayed as a 'positive-sum game' or a 'win-win' situation that allows them to have it all (Hajer, 1995; Gibbs, 2000; Livesey, 2002; O'Dwyer, 2003; Gouldson *et al.*, 2008). "Not only does it deliver environmental improvement, but also it does so without seriously challenging existing economic practices" (Gibbs, 2000, p.17). Eco-modernists therefore tend to be optimistic about the future (Gouldson and Sullivan, 2012).

Central to the operationalisation of this concept are five notions. First and foremost, on a micro-economic level, there is a fundamental assumption that economic growth and the resolution of ecological problems can—and should—go hand-in-hand. Therefore, at the core of ecological modernisation is a utilitarian logic: "prevention pays". Specifically, it is perceived that reacting through customary remedial strategies to environmental issues is a less rational approach and more costly than taking a pro-active prevention stance. Second, on a macro-economic level, environmental issues are made calculable by framing problems/impacts into monetary terms that makes them count for business in terms of potential profit and loss. Importantly, nature in

economic terms is no longer regarded as a sink or free resource, but as a kind of natural capital whose usage comes at price. Therefore, ecological modernisation allows costs and benefits to be taken into account during decision-making, thus facilitating improvements in both environmental and business management. Third, unambiguous scientific proof is not considered a *sine non qua* for taking action. Eco-modernists recognise the complexities and intricacies of environmental problems but do not use them as reasons for inaction. Instead, failure (to grow economically) is attributed to a lack of collective societal action. Fourth, public perceptions of risk are no longer refuted as irrational and are considered as drivers for action. New stakeholders are acknowledged in a more open policymaking arena of 'participatory practice', whereby corporations try to accommodate concerns and beliefs into their business functions. Finally, EM argues for the 'reversal of the burden of proof'. Here, an environmental impact should more often be regarded as guilty until proven innocent, rather than innocence until proven guilty (Hajer, 1993; Hajer, 1995; Gibbs, 2000; Gouldson *et al.*, 2008).

Given the hypothesised win-win outcome of ecological modernisation, it is perhaps understandable that it has contributed to a number of policy discourses, including the 1980s acid rain controversy and sustainable development (Hajer, 1995; Gibbs, 2000; Milne *et al.*, 2009; Solomon *et al.*, 2011). For instance, in regard to acid rain, the UK Government recognised how beneficial an ecological modernisation approach could be. Not only did it offer a reply to spreading public concern, but it also left the basic social order unthreatened by framing the prevention of pollution as economically rational (Hajer, 1993). Similarly, the concept of ecological modernisation fit neatly into the Government's revised sustainable development strategy in the late 1990s, with environmental protection "perceived as an *opportunity* for business to produce new goods and services and thus to gain a competitive edge in world markets" (Gibbs, 2000, p.15). In particular, characteristics of ecological modernisation theory were incorporated into (sustainable) regional policy legislation, where economic strategies contained details of the environmental situation and an assessment of the environmental impact of the strategies.

Yet, despite ecological modernisation's reputation as "the dominant […] environmental policy theory" (Korhonen, 2008, p.1331), its subsequent translation into policy *implementation* has proven problematic (Gibbs, 2000). For example, Hajer (1993, p.66) noted in regard to acid rain that "the actual decision-making process was still conducted according to the format of the traditional pragmatist discourse coalition" because ecological modernisation "failed both to impose its storyline on the actual acid rain debate and to illuminate the anachronistic nature of the existing institutional arrangements" (Hajer, 1993, p.66). Similarly, Gibbs (2000) reflects that although the practical implications of ecological modernisation were incorporated into regional policy legislation, actual application appeared to be progressively watered down in the move from policy formulation to implementation. Gibbs (2000) goes on to suggest that ecological modernisation may have more to offer as a theoretical approach that enables policymakers to consider problems of policy implementation than as a concrete basis for policy. These examples imply that in practice the promises of ecological modernisation have been only partially achieved.

In terms of influencing how stakeholders tackle climate change ecological modernisation may already be the clear driving force. Certainly the economic landscape has changed rapidly, with arguments being put forward that it will be cheaper to tackle climate change than not to (Stern, 2006), and that there are major social, environmental and technological opportunities in a low-carbon economy (Gouldson and Sullivan, 2012). What's more the paradigm of climate change, as Bailey *et al.*, (2011) argue, has been rapidly reframed in ways that make it economically less threatening and politically more manageable without dramatically changing the status quo – this in itself is a classic manifestation of ecological modernisation. Therefore, it is conceivable that ecological modernisation is seen (by organisations) as an appealing blend of optimism and pragmatism that can help address climate change whilst ensuring economic stability at the same time. If this is the case, the findings of the thesis should demonstrate a strong correlation between the perception that addressing climate change will allow a company to carry on trading and turnover a profit. In fact, research on UK supermarkets has already indicated that climate change actions are underpinned by the perception that reducing emissions facilitates cost savings and financial returns (Sullivan and Gouldson, 2012; Gouldson and Sullivan, 2013). Moreover, some organisation are utilising ecological modernisation to encourage their stakeholders to change behaviour. For example, Aviva's "Pay as You Drive" service attempts to encourage customers to embrace low carbon lifestyles by saving money (Okereke, 2007), but there is no systematic research to assess how widespread such initiatives may be in the business community.

Even if they were, critics charge that ecological modernisation influenced responses focus more on "the symptoms rather than the underlying causes of major environmental problems and that as a result they do not really present much of a fundamental solution" (Gouldson and Sullivan, 2012, p.116). Therefore, climate change activists may heavily criticise organisations that appear to be applying light touch responses such as recycling, energy efficiency, rather than core responses that focus on using renewable energy instead of carbon intensive energy sources. Furthermore, there is also a question over whether ecological modernisation is a useful guide for anything other than the short- to medium-term issues because even if regulation can establish the imperative for climate action, there may ultimately remain "structural limits which make it impossible to continually realise combined economic and environmental improvements as a result of innovation" (Murphy and Gouldson, 2000, p.43). Therefore, taken together with other concerns about how "the theory divorces social justice issues from environmental issues" (Murphy and Gouldson, 2000, p.43), there are reasons to doubt the effectiveness of ecological modernisation as a 'solution' to longer-term environmental problems such as climate change which will require constant readjustment of targets and flexible management strategies (e.g., adaptation reporting).

2.3.2 Reporting to shape external stakeholder opinion

A counter perspective to ecological modernisation in academic research proposes that corporate social and environmental disclosures are generally made for strategic reasons having little or nothing to do with perceived responsibilities or opportunities for efficiency gains (Deegan *et al.*,

2002; Laufer, 2003; Vos, 2009; Lyon and Maxwell, 2011; Mahoney *et al.*, 2013). Rather disclosures are designed to either "gain or extend legitimacy, to maintain its level of current legitimacy, or to repair or to defend its lost or threatened legitimacy" (O'Donovan, 2002, p.349). From this perspective reporting is an attempt to manage (repair and shape) public perceptions, pressures and opinions through a game of persuasion, in which the reporting authority has "certain pieces of verifiable information that he can either disclose or not" (Lyon and Maxwell, 2011, p.5). Consequently, reporting is often seen as symbolic in nature, and does not necessarily address the full range of environmental and social issues required to adequately assess a corporation's behaviour (Deegan *et al.*, 2002; Laufer, 2003).

For some stakeholders this points towards a form of "disinformation" providing partial if not even deliberately false messages to influence internal and external audiences. To those ends companies are said to cynically utilise three elements of deception—confusion[5], fronting[6], and posturing[7]—to manipulate public opinion and cover up bad practice (Laufer, 2003; Vos, 2009; Mahoney et al., 2013). Though not fraudulent, "selective disclosure of positive information about a company's environmental or social performance, without full disclosure of negative information on these dimensions, [is intended] to create an overly positive corporate image" (Lyon and Maxwell, 2011, p.9). The dissemination of more favourably information can deflect attention from an organisation's less savoury activities (e.g., environmental degradation), to forestall any real changes in corporate activity, or persuade stakeholders that performance is sound or better than it is in reality (Vos, 2009). Consequently, many studies have suggested social and environmental reporting is highly partial and subject to substantial selection biases, since typically the share of negative events compared to positive events is negligible; something only amplified as the environmental sensitivity of an industry increases (Deegan and Rankin, 1996; Niskanen and Nieminen, 2001).

This critical perspective on corporate reporting calls attention to the phenomenon of "greenwashing" (also known as bluewashing[8]) whereby a company intentionally utilises environmental and social attributes to paint a "greener" picture of whatever they are reporting on than a more complete environmental/social analysis would support (Greer and Bruno, 1996; Lyon and Maxwell, 2011; Mahoney *et al.*, 2013). Hence, greenwashing implies a company's disclosed information (reports) does not (necessarily) correspond with their actual social and environmental performance (Cho and Patten, 2007; Jose and Lee, 2007; Vos, 2009). Instead reporting helps mediate their reputation by acting as a legitimising strategy that creates the illusion of the company being a good corporate citizen even if they are not (Greer and Bruno, 1996; Adams, 2004; Guidry and Patten, 2010; Mahoney *et al.*, 2013). Consequently, the term greenwashing is often used to

[5] Confusion occurs naturally inside an organisation because of the complex nature of the corporate structure, whilst external confusion is achieved by managing the information made available to stakeholders.

[6] Fronting is accomplished internally through the employment and representations of compliance officers and ethics committees, whilst reverse whistle blowing helps facilitate external fronting.

[7] Posturing seeks to convince both internal and external stakeholders of their (the organisation) collective commitment to being ethical and reporting ethically.

[8] Bluewashing refers to using the reputation of the United Nations as a legitimising tool.

reflect an increasing apprehension in society (Jahdi and Acikdilli, 2009) that some corporations are creatively managing their reputations with stakeholders "so as to hide deviance, deflect attributions of fault, obscure the nature of the problem or allegation, reattribute blame, ensure an entity's reputation and, finally, seek to appear in a leadership position" (Laufer, 2003, p.255). Clearly then, associated with greenwashing is panoply of evils – from the manipulation of public opinion to the explicit attacks against environmentalists.

In terms of application evidence suggests greenwashing is a widespread corporate practice. For instance, a survey conducted by TerraChoice Environmental Marketing Inc. into six-category leading big box stores identified that of 1018 consumer products bearing 1753 environmental claims, all but one made "claims that are demonstrably false or that risk misleading intended audiences" (Bazillier and Vauday, 2011, p.3). In fact, greenwashing behaviour is said to regularly occur in the so-called 'sin industries' (e.g., tobacco manufacturers, oil companies, and car producers). For example, Vos (2009) reflected that the car manufacturer Toyota have capitalised on the positive reputation of the Prius (a gas electric hybrid motor vehicle) to draw attention away from its worsening fuel efficiency record for its entire fleet of vehicles. Similarly Jahdi and Acikdilli (2009) argue Shell and BP (as well as other businesses) have utilised social and environmental reporting to re-brand themselves and downplay less ethical practice(s).

In fact, critics charge that greenwashing is rife in environmental policy statements and social and environmental reporting, where a lack of clear commitment post-reporting (e.g., none creation of sub-policies) and omissions of negative environmental performance have had 'advantageous' consequences for the reporting authority (Adams, 2004; Doane, 2005; Ramus and Montiel, 2005; Vos, 2009; Bazillier and Vauday, 2011; Belal and Cooper, 2011). In particular, non-disclosure has helped serve corporate interests whilst also providing benefits for management and investors by simultaneously enhancing corporate credibility and sustaining economic growth (Jahdi and Acikdilli, 2009; Vos, 2009; Bazillier and Vauday, 2011). As such social and environmental disclosure has sometimes been described as an 'iceberg', since only a small portion of the total environmental impacts can be seen poking above the surface (Jahdi and Acikdilli, 2009).

From this greenwashing perspective, climate reporting has more in common with marketing and public relations than with accounting. Like advertising campaigns, reporting seeks to garner legitimacy and credibility for corporations through the calculated communication of an socially and environmentally favourable image to stakeholders (Beder, 2000; Frankental, 2001; Munshi and Kurian, 2005; Jahdi and Acikdilli, 2009; Perez-Batres *et al.*, 2012). Exemplary of this cause-related marketing are "programmes in the UK like a supermarket's (Tesco) computers for schools […] are aimed at providing community benefits through increased sales" rather than tackling the larger questions that social and environmental reporting should be confronting about, "the ways in which they do business" (Doane, 2005, p.218). The consequence of such (greenwashed) reporting has resulted in increased levels of scepticism over social and environmental disclosure; in particular, there is a view that firms only engage in social and environmental reporting if they have an economic interest to do so (Jahdi and Acikdilli, 2009; Bazillier and Vauday, 2011). Therefore, it can

be argued report quality, credibility, and legitimacy may be sacrificed at the expensive of ensuring the report fulfils its reputational purpose. Indeed, researchers like Gouldson and Sullivan (2007) have frequently argued investors and other stakeholders are often more concerned about whether an organisation has a report on issues such as social and environmental reporting than they are about the quality of that report or what it says about the firm's environmental performance.

Several features of corporate climate reporting make it an ideal medium for greenwashing behaviour to flourish. First of all greenwashing climate information is theoretically possible because stakeholders can be less certain about the impacts changes in climate will have on companies because of uncertainty with climate change. In fact, the usefulness of information is already questioned widely in the literature (Pfeifer and Sullivan, 2008; Andrew and Cortese, 2011a; 2011b). Climate change is a very complex issue; many of the causes and impacts are unique to businesses and will remain uncertain given the long-term nature of the issue. The degree of impact will not be known until the event of change is deemed to have actually occurred and it is possible to look at reports in hindsight. Secondly, as a 'wicked' problem climate change involves many dimensions, and this complexity invites companies to be selective in their climate disclosure activities in hopes of micro-manage stakeholders' perceptions (Okereke, 2007; Knox-Hayes and Levy, 2011; Ascui and Lovell, 2012), by both enhancing corporate credibility and legitimacy and from the fear of losing competitiveness with rivals who are reporting on climate change, greenwashing behaviour for some companies maybe all too easily incentivised. Thirdly, there is a suggestion that investors are more interested in whether a company is reporting rather than its quality (Sullivan and Gouldson, 2012). This lack of scrutiny also invites greenwashing as well as pointing to underlying shifts in the rationale for reporting as something increasingly done because competitors do it rather than for any substantive or instrumental purpose.

2.3.3 Reporting as a form of governmentality

Governmentality provides a third (but by no means final) perspective from the literature on the question of why companies disclose social and environmental information. In this perspective a company's motivation to report is not necessarily driven by a clear purpose or intention to be consciously more ecologically and economically efficient, and/or to mislead others into thinking they are more green than they actually are. Rather, reporting is a responsive practice to social structures, norms, and rules that materialise from the subtle ways that 'power'—the capacity or ability to direct or influence the behaviour of others or the course of events, which is constituted through accepted forms of knowledge, scientific understanding, and truth (Foucault, 1977; 1991; 1998)—works in society. That is, corporate reporting is a practice primarily performed to fulfil requirements and meet the conditions of the environment in which they operate within. This environment is shaped by 'technologies of power' that are "imbued with aspirations for the shaping of conduct in the hope of producing certain desired effects and averting certain undesired ones" (Rose, 1999, p.52). Three basic technologies of power are said to co-exist (Foucault, 1977; 1991; 1998).

One technology of power has always been present – the game between actors with contrasting positions towards a similar end (e.g., target, goal, task, activity, etc.). For example, two company employees are tasked with deciding how their company should respond to a new regulatory demand that they improve energy efficiency. Both employees have an idea on what should be done. Employee A, a senior manager, wants to install energy efficient lighting, whilst Employee B, an analyst, wants to replace all electronic equipment with new energy efficient models. A discussion occurs, with a decision made to implement one of these changes. One employee (typically Employee A because of their higher hierarchical position) exerts power over the other employee when their idea is chosen. For Foucault (1998) this indicates that 'power is everywhere' and 'comes from everywhere'.

A second technology of power termed 'discipline' (Foucault, 1977) is defined by the non-violent, less public, and subtle conditioning, restoration, or rehabilitation of an actor to behave by a set of normative standards. This is different to the more historic form of sovereign power where actors have to abide by state laws and regulations to avoid violent public punishment (e.g., public execution) if they fail to comply. Exercising and demonstrating the state's (sovereign) power in a pubic, violent, and repressive manner intends to create fear and discourage other actors from also breaking the law or failing regulation. By contrast, disciplinary power is exercised through continuous, though non-violent observation or surveillance of actors by state institutions (e.g., prisons, education system, hospitals, military, etc.) that organise space, time, and everyday activities. Under this system of surveillance actors are turned into 'docile bodies' that learn to discipline themselves and behave in expected ways (as defined by the state) because acts of resistance do little to change the status quo (Foucault, 1977). The state, through its surveillance, gains more knowledge and thus more power over its subjects.

A third technology of power termed 'governmentality'—which builds on disciplinary power—can be broadly understood as how conduct is shaped; making 'the art of government' an embodied experience where actors are taught to govern themselves (Foucault, 1991). In this context the term 'government' does not just apply to state politics (e.g., political structures or to the management of the state); it has a very broad meaning (as it did in the sixteenth century) that applies to philosophical, religious, medical, and pedagogical tracts (Foucault, 1982; Lemke, 2002; Bröckling *et al.*, 2010). Government not only refers to the way in which the conduct of actors is directed through "constituted forms of political or economic subjection, but also modes of action, more or less considered and calculated, which were destined to act upon the possibilities of action of other people. To govern, in this sense, is to structure the possible field of action of others" (Foucault, 1982, p.221). For this reason, the term government is defined as a "conduct, or, more precisely, as the 'conduct of conduct', and thus as a term that ranges from 'governing the self' to 'governing others'" (Lemke, 2002, p.50-51). Governmentality then, not only refers to the way in which the state exercises control or governs its actors, but also the way in which actors are taught to govern themselves. It operates to produce a governable subject. Consequently, in this technology, power is less a confrontation between two adversaries. Power emerges when certain behaviours and beliefs

are internalised by actors to guide their actions. For example, a regulator aims to instil a set of morals and values into a company it regulates in the hope that the company will act within this structure in the absence of regulatory pressure. Morals and values are repeatedly espoused by the regulator until the company acts in accordance and without prompt. This is said to lead to more efficient forms of social control, as knowledge enables individuals to govern themselves (Foucault, 1982; Lemke, 2002). This orchestration of action, where actors are socialised over time into thinking certain behaviours and beliefs are natural, is an indirect way of making actors do what they might not have otherwise done.

For Foucault (1982) this is a very important part of modern politics, where societies are run by an ever-present set of relationships and practices that form actor subjectivity and discipline their practices. Indeed, governmentality has often been applied to advanced liberal (Western) democracies to explain the shift form the Keynesian welfare state[9] toward so-called free market polices and processes of neoliberal economics[10] (Rose, 1996; Lemke, 2001; Ferguson and Gupta, 2002; Peck and Tickell, 2002). Specifically, contra to the 'retreat' or 'rolling back' of the state argument, operations of government (in Foucault's logic) are transferred to non-state entities via "the fabrication of techniques that can produce a degree of 'autonomisation' of entities of government from the state" (Barry *et al.*, 1996, p.11-12). That is, governmental technologies seek to make markets and firms govern themselves according to norms of efficiency, accountability, and transparency, and to make individuals govern themselves according to norms of civility, wealth, and well-being (Rose and Miller, 1992; Rose, 1999, Triantafillo, 2004). This 'hollowing out of the state' (Rhodes, 1994; Jessop, 2013) saw "power flow sideways and downwards from the central state to a myriad of subsidiary bodies, both within and without the formal boundaries of the state" (Holliday, 2000, p. 168).

[9] The Keynesian welfare state was the dominant economic paradigm after World War two (from 1950 to the late 1980s). Policy thinking and management practices were characterised by strong state intervention that safeguarded the public interest from the private market's irrationalities and inefficiencies (Moran, 2001; Hubbard *et al.*, 2002). This bureaucratised and centralised style of regulation applied the twin tools of fiscal policy (e.g., state investment in infrastructure) and monetary policy (e.g., a reduction in interest rates) to stabilise and stimulate the economy (Moran, 2001; Hubbard *et al.*, 2002). Under this environment (e.g., nationalisation programme) much of the UK's critical infrastructure was publicly owned (Moran, 2001). However, despite the state's widespread control over social and economic life there remained vast pockets that lay beyond the control of the state and were in fact self-regulated (Moran, 2001). Thus, although most of social and economic life was regulated, the actual percentage regulated by the state was relatively low; a statistic that did not sit well with some sections of Parliament (and society), whom in the 1970s cited and held Keynesianism based policies and actions responsible for the prolonged economic crisis (Moran, 2001; Peck and Tickell, 2002).

[10] Neoliberal economics (also neoliberalism) has been the dominant economic paradigm in the last 30 years. It emphasises the efficiency of market competition, the role of individuals in determining economic outcomes, and distortions associated with state intervention and regulation of markets. Two critical principles of neoliberalism are its theory of income distribution and its theory of aggregate employment determination. Specifically, in regard to income distribution, neoliberalism asserts that factors of production (e.g., labour and capital) get paid what they are worth. Whilst in regard to aggregate employment determination, neoliberalism asserts that free markets will not let valuable factors of production go to waste.

Thus this was not a matter of less government by the state; rather, it was a "new modality of government, which works by creating mechanisms that work 'all by themselves' to bring about governmental results through the devolution of risk onto the 'enterprise' or the individual (now construed as the entrepreneur of his or her own 'firm') and the 'responsibilisation' of subjects who are increasingly 'empowered' to discipline themselves (see Barry et al. 1996; Burchell 1996; cf. Burchell et al. 1991; O'Malley 1998; Rose 1996; Rose and Miller 1992)" (Ferguson and Gupta, 2002, p.989).

For Moran (2001) this is the 'rise of the regulatory state' – the transformation from state-centred regulation to network-based governance. This shift is "often described as a shift from govern*ment* to govern*ance*" (Jessop, 2013, p. 16), where the state does not lose power. Instead governance is used to "enhance the state's capacity to project its influence and secure its objectives by mobilising knowledge and power resources from influential non-governmental partners or stakeholders" (Jessop, 2013, p. 16). Therefore, although the state devolves some of its public responsibilities to private institutions and stakeholders, it aims to remain in a role of importance and retain some of its authority by "becoming more involved in organising and steering the self-organisation of partnerships, networks and governance regimes" (Jessop, 2013, p. 19).

Reporting can be seen as part of this, a form of governmentality that enables the state to govern business at a distance. Insofar that getting firms to report (even in a voluntary capacity) provides the state with enough information to make decisions, which in turn directly or indirectly allows them to regulate the very firms that have reported (Lemke, 2002; Rose *et al.*, 2006; Miller and Rose, 2008). The very act of reporting can be viewed under a similar lens to Foucault's work that used Panopticon[11] as a metaphor to explore the relationship between systems of social control and people in a disciplinary situation, and the power-knowledge concept. Like Panopticon, corporate reporting subjects the company to constant observation and monitoring of its behaviour (e.g., business company's climate actions) without it truly knowing the extent to which it is ever being analysed. This constant surveillance (e.g., regular disclosure of climate information through reporting) acts as a control mechanism since subjects (being monitored), conscious of this constant surveillance, act appropriately to avoid discipline and punishment. The subsequent actions of the state are based upon this monitoring and the behaviours observed (from reporting) (Foucault, 1977).

The origins of this analytical perspective on reporting can be traced, in part, to the political developments surrounding the privatisation of then public sector-owned organisations, which saw a huge expansion in the volume and transformation in the purpose of reporting (Shore and Wright, 1999). In order to enable a smooth transition, a hybrid form of financial accountancy[12] was seen as

[11] The Panopticon is an architectural design put forth by Jeremy Bentham in the mid-19th Century for prisons, insane asylums, schools, hospitals, and factories that sort to regulate its subjects in a less obtrusive dominant manner and exercised power in line with a more progressive democratic society.

[12] Financial accountancy not only embraced traditional exercises but also assessed quality and effectiveness of service provision (Shore and Wright, 1999).

the ideal tool for monitoring performance, identifying best practice, improving value for money and ensuring effectiveness of management systems. Significantly, this approach developed into such a hallmark of good corporate governance that it soon began to migrate into new domains of working life—including healthcare, technology, education, and environmental management, amongst others—resulting in the conceptual inflation commonly termed the "audit explosion" (Power, 1997; Shore and Wright, 1999; Hodkinson, 2008; Macintyre *et al.*, 2008). This proliferation of auditing, "the transforming of existing, and the emergence of new, formal institutions for monitoring" (Power, 2003, p.188), created an 'audit culture' where audits (e.g., reporting/disclosure) become the central means of legitimisation for a wide range of entities and groups. For example, the Education sector established an Office for Standards in Education, Children's Services and Skills (Ofsted) as the principal authority to inspect schools and also scrutinise the effectiveness of local education authorities, teacher training establishments and curriculum and educational research (Shore and Wright, 1999; Humphrey and Owen, 2000).

How auditing behaviour developed into a standardised business culture was made possible by the strength of the idea of audit and its apparently wide range of virtues (Power, 1994). Advocates of auditing perceive it to be an open and enabling process that symbolises a cluster of values and qualities, including: legitimacy, reliability, efficiency, effectiveness, rationality, and the promise of control, amongst others. These characteristics emerge because companies are able to monitor, enhance and control their own performance and quality whilst being simultaneously judged by stakeholders on the very targets and standards they set for themselves (Power, 1994; Shore and Wright, 1999; Humphrey and Owen, 2000). As such, to be audited or to say one is doing an audit is to claim institutional credibility for what one does because companies are facilitating the open monitoring of (organisational) performance through 'management control systems' (Power, 1994; 1997; 2003; Maltby, 2008). Therefore, being auditable is a symbol of acceptability that is indicative of the ideals of transparency, accountability and managerial willingness to learn.

For some commentators this auditing explosion is said to have created a society that is more obsessed with checking and monitoring performance rather than actually 'doing' (Power, 1997; Humphrey, 2008). "What can matter more is not what is done or achieved in the name of auditing, but what is perceived to be done" (Humphrey and Owen, 2000, p.32). Thus, arguably society is more concerned with the monitoring of service provision than the provision of the services themselves. For Power (1994; 1997; 2003) this spread of audits and quality assurances has created an 'audit society', where audit is the craft providing comfort rather than proof, and being auditable has emerged as a new rationale of governance. According to Power (1997) this emerges because the procedure of auditing is representative of a practice he terms the 'control of controls', a never-ending, ever deepening cycle of monitoring and checking, in which first-order questions of quality become secondary to the logic of management integrity, resulting in the audit process acting as a virtualistic form of 'meta-regulation' (Power, 2003). From this perspective reporting can be perceived as a tool of regulatory control and supervision; it facilitates the establishment of clear

targets and the subsequent rational evaluation of them over set periods of time, as well as promoting comparisons of outcomes between actors.

Unintentionally though auditing practices are damaging organisational trust (Power, 1994; Hodkinson, 2008; Stubbs *et al.*, 2013) and have facilitated a 'culture of compliance' in a number of domains (e.g., Education), especially when regulation is a looming spectre and non-compliance is punished (Shore and Wright, 1999). More specifically, 'elaborate games of compliance' are said to occur when companies produce measures of activity (in their report) which enable them to be subsequently held to account through 'audits' or 'inspections' that place emphasis on form rather than content (Power, 2003; Lapsley, 2008). The side effects of this behaviour include minimalistic disclosure, the adoption of a 'tick-box attitude' that utilises audit templates for compliance, and the employment of dedicated environmental specialists trained in environmental science to give disclosure scientific credibility (Lapsley, 2008; Stubbs *et al.*, 2013). Moreover, audit behaviour is said to result in defensive strategies and a blamist culture (Hood, 2002); a culture that not only stifles organisational innovation but also subsequently lowers employee morale. As such, auditing remains an ambivalent practice often seen as prone to manipulation, with the true value for participating companies (auditees) unclear (Power, 1997). However, it is important to note that this phenomenon cannot necessarily be viewed as entirely negative in nature since Power's arguments for an audit society are deliberately argumentative and selective in terms of the evidence used to support his claims (for more detailed arguments against Power's thesis see Humphrey and Owen, 2000; Maltby, 2008).

These debates about auditing and the audit society are applicable to the climate change agenda. Although adaptation reporting is a relatively new form of disclosure, information on corporate emissions is already monitored by a number of stakeholders. For example, CDP, an independent not-for-profit organisation[13], ranks emissions performance of business organisation (as well as undertaking other functions). According to Pattberg (2012, p.616), these types of interactions between business organisations and non-state actors like CDP are helping to transform climate change into a business risk and thereby making the issue more "governable through the instrument of disclosure based transparency". This auditing of emissions is having two profound effects. First and foremost, more and more businesses are reporting on their emissions in order to not fall behind their competitors (Okereke, 2007). Secondly, with interested stakeholder groups becoming more knowledgeable on how organisations are addressing climate change, the practice of corporate climate reporting has become normalised in some companies and sectors. The result of which has increased the pressure on non-reporting businesses to get in line and report for the first time (Okereke, 2007; Sullivan and Gouldson, 2012). Coincidentally this creates Power's 'control of controls', and demonstrates the conduct of conduct in governmentality as firms govern themselves.

[13] CDP is an independent not-for-profit organisation working to drive greenhouse gas emission reduction and sustainable water use by business and cities. They provide a transformative global system for thousands of companies and cities to measure, disclose, manage and share environmental information.

In addition, to these monitoring organisations, the UK is one of few nations to have put in place regulatory legislation on climate mitigation and adaptation, and to have statutory climate reporting requirements for UK-listed companies. These mandatory requirements, detailed in Chapter 4, may encourage a culture of compliance to develop due to their purpose, scope and governing mechanism. If this does appear to be developing it is possible to argue that climate reporting is a symptomatic arm of the audit society Britain has arguably become. The consequence of which may weaken the value and ability of climate reporting to initiate action if companies solely perceive reporting as an opportunity to gain auditability to climate regulation or societal expectations.

2.4 Summary

Corporate reporting, whether financial or non-financial, is based on the principles of accounting. That is, company's measure and quantify economic, social or environment information into metrics that can be used to understand and appraise corporate activities. While the application of accounting principles in financial reporting is essential, its use in social and environmental reporting is contested because the processes are not necessarily useful for decision-making. This raises questions about the inherent purpose of social and environmental reporting for companies. Research investigating why companies do social and environmental reporting commonly identifies three broad organisational cultures and behaviours—ecological modernisation, greenwashing, and audit culture—that influence and determine reporting practice. Their prevalence in social and environmental reporting makes it possible to apply them to climate reporting. Specifically, for certain companies climate reporting will be about win-win outcomes, whereby reporting helps identify where climate mitigation and/adaptation can be made that will lead to an economic return. Equally though, for other companies climate reporting will be about managing their image (greenwash) instead of generating an economic benefit. If this proves to be the case then it arguably suggests that climate reporting is representative of a 'fantasy document'. In essence, what appear to be rationalistic plans and rational-looking planning processes are in actual fact badges of rationality to convince audiences that they ought to believe in what an organisation says (Clarke, 1999; Birkland, 2009). Finally, for some companies climate reporting is exemplar of a management control system, whereby reporting is utilised as a means for creating a form of auditable representation of their emissions or risks and accountable actions. As such it is these questions the thesis aims to investigate.

Chapter 3 Methodology

3.1 Introduction

There is "no single 'right' way of tackling a research problem in human geography' (Martin and Flowerdew, 2005, p.7). The relative strengths and weaknesses of each methodology need to be considered carefully at the outset of a research design and a decision made as to whether or not the respective methodology is appropriate to realise the aims of the study in question. Therefore, outlined hereafter are the methodological procedures that were performed for this piece of research.

The chapter has four sections. Section one outlines the ontological and epistemological orientations that influenced the research design. Section two outlines the criteria used to identify the sample. That is, the scope and universe of UK-listed companies studied. Section three explains how the research was conducted, particularly focusing on the data collection techniques employed that included: an extensive desktop review of corporate (climate change) materials; a phase of intensive multi-case study interviews and document analysis; and supplementary third party conversations with select stakeholders. Section four outlines the general analytical approach used to interpret the collected data and break the problem down into the elements necessary to solve it. Finally, the chapter closes by linking the research design to the research questions proposed in Chapter 1.

3.2 Approaching the Research Design

To ensure the study truly contextualised the critical debates it intended to explore (and did not produce a sterile philosophical debate), a 'critical realist' approach (sometimes also termed 'critical naturalism' in social science research) was used to recognise and address the complexities of corporate decision-making and organisational structures in a holistic manner by combining a realist ontology with an interpretative epistemology (Bhaskar, 1975; 1998; Dobson, 2001; Dobson *et al.*, 2007; Bygstad and Munkvold, 2011; Wynn Jr and Williams, 2012). The non-deterministic view on causality espoused by such an approach helps resolve conflicts and inconsistencies between implicit ontological assumptions and research practices—which are barriers to developing useful, usable and actionable theory (Mingers 2004; Smith 2006)—that are often created by positivist and interpretivist approaches.

Critical realist-based research aims to understand and explain the underlying factors and rationales for observed actions rather than determine general laws and regularities of events because it assumes a so-called 'depth-realism' exists that enables and constrains events (Bhaskar, 1998; Dobson *et al.*, 2007; Wynn Jr and Williams, 2012). For critical realists reality is made up of three ontologically distinct realms: the real (structures, mechanisms and powers of behaviour change), the actual (the event), and the empirical (the experience). Under this stratified ontology the three realms

interact iteratively whereby structures, mechanisms and powers (the real) trigger events (the actual) that we may (or may not) experience (the empirical). Thus, an event and our experiences of that event are also said to be subject to and governed by a series of underlying structures, mechanisms and powers that make up the world. For critical realists it is these structures, mechanisms and powers that "are the primary focus of such an ontological realism" (Dobson *et al.*, 2007, p.140). A critical realist approach aims to facilitate the identification and development of in-depth causal explanations for outcomes that take into account a breadth of social, economic, environmental, and organisational influencing factors. To that end it is seen as an appropriate lens to examine the actions and interactions of companies in their understanding, application, and responses to climate reporting, while simultaneously accounting for the role of underlying structural factors influencing corporate culture and behaviour.

In order to explain how and why experienced events occur critical realists employ "an intensive study, with a limited number of cases, where the researcher systematically analyses the interplay between the layers" (Bygstad and Munkvold, 2011, p.3). Multiple observations of a single event are sought to achieve a deeper fuller understanding of social situations in order to address uncertainty and scepticism in provisional incomplete theories, as well as encourage a continued commitment to reflexivity (Dobson et al., 2007). Three methodological processes compatible with this philosophy include triangulation, iteration, and grounded theorisation because each encourages on-going comparative analysis and multiple observations from different angles of the same event (Yeung, 1997; Yin, 2003, Wynn Jr and Williams, 2012). The study incorporates each as follows.

To acknowledge reality, which is made up of many types of structures each of which call for different means to develop knowledge (Wynn Jr and Williams, 2012), 'triangulation'—the cross-examination of data by method, source, and/or analytical approach—was employed to establish more credible and valid conclusions (Yin, 2003; Guion *et al.*, 2011). Comparing two or more similar sets of data obtained from different sources or using different methods of data collection introduces greater rigour to the identification and understanding of emerging themes. If two or more methods and sources produce similar results it is possible to assume the finding is credible, while conversely if results clash then the question or data collection techniques must be reframed to improve reliability. This enhances the research accuracy and quality by overcoming the confirmation biases intrinsic to narrow approaches that rely on a single method or source. For instance, if only one method is used there is a strong temptation to believe in the findings if they fit the hypothesis or research agenda (Yeung, 1997; Olsen, 2004). Therefore, the study adopted the research design illustrated in Figure 3-1.

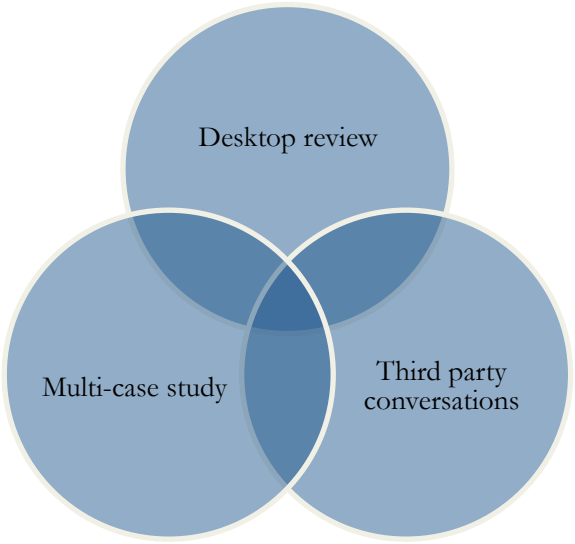

Figure 3-1: The multi source data collection approach to triangulate findings and conclusions

The study, as will be explained in more detail below in '3.4 Conducting the Research', included an extensive desktop review of corporate (climate change) materials, a phase of intensive multi-case study interviews and document analysis, and supplementary third party conversations with select stakeholders to test the insights developed through the first two phases of research (Figure 3-1).

To drive the research protocol forward and to allow the generation of theories and the continuous reflection of these theories as more data is collected, 'iteration'—the act of repeating a process usually with the aim of approaching a desired goal, target or outcome—was employed. Specifically through iteration tentative theories are formed from the initial abstraction of data, then as more and more empirical evidence is gathered these theories are revised or reaffirmed repeatedly until the process yields no further contradictory evidence and the theories appear robust enough to explain an outcome (Yeung, 1997). This study used iteration in the same manner. For each data collection phase (Figure 3-1) a pilot study was performed that evaluated feasibility, time, cost, and statistical variability to ensure the sample size was appropriate, and the collected data was relevant to the research aim and objectives. Light analysis was performed during data collection to identify emergent themes that may need further investigation. As more data was collected theories were strengthened or revised accordingly until no substantial new evidence was identified or a consensus emerged.

Finally, given the study "explores new phenomena in an emerging and rapidly evolving field of research […] which is as yet under-theorised" (Ascui and Lovell, 2012, p.50) the research design drew upon elements of 'grounded theory'. In a traditional grounded theory approach the researcher conceptualises the latent social patterns and structures they are investigating through the process of constant comparison (Glaser and Strauss, 1967; Struass and Corbin, 1998). It emphasises different strategies of coding, where the researcher firstly analyses the data for key points, groups these points into similar concepts, and then converts these concepts into categories that become the basis

for the creation of a theory. It indicates where next to collect data and which more focused questions to ask. As such, grounded theory can be framed as the reverse generation of a hypothesis; data is collected first and then the theoretical framework is identified (Kitchin and Tate, 2000). In terms of this study, given three broad organisational reporting perspectives—ecological modernisation, greenwashing, and audit culture—were presented in Chapter 2, only elements of grounded theory were applied. In particular, during data collection, open and substantive coding was applied, with memos made on any emerging theoretical developments. The data, codes and memos were scrutinised through selective coding and theoretical sampling, the outcomes of which were then triangulated with the literature presented in Chapter 2. The developing theory was used to help indicate where additional data collection should occur, and identified which, more focused, questions to ask.

By combining these three methodological processes it allowed the research to be flexible but maintain the intellectual rigour of an in-depth investigation. Data collection therefore worked as a continuous process whereby iterative themes emerge through open-ended and substantive coding of observed phenomena. Empirical material not only informed subsequent data collection to ensure it was consistent with the research agenda, but also contributed to the generation of theories that evolved as more data is collected.

3.3 Refining the scope and universe of UK-listed companies to be studied

From 2012 to 2014 the population of the UK business community increased from 4.8 to 5.2 million (Department for Business Innovation and Skills, 2012; 2013; 2014). Included in this figure is a range of companies that vary in terms of size (e.g., small to multinational), ownership (e.g., private, public or listed), and industry sector (e.g., banks, beverage, retail). Each company and sector has its own unique perspective (i.e., organisational culture and behaviour) towards contemporary issues (such as climate change). Therefore, establishing a sample universe that is a) simultaneously manageable and a fair reflection of the diverse range of perspectives to climate change; b) generates useful, usable and actionable research outcomes that enable practitioners to make informed decisions; and c) contributes to theoretical debates required careful planning. To assist in capturing such a sample the methodological approaches and findings of related academic research (Okereke, 2007; Spence, 2007; Ascui and Lovell, 2011; Knox-Hayes and Levy, 2011; Ascui and Lovell, 2012; Hassan and Ibrahim, 2012; Nyberg and Wright, 2012; Sullivan and Gouldson, 2012; Gasbarro, 2013; Hassan *et al.*, 2013) and grey literature (Defra, 2009; Ceres, 2010; Amado *et al.*, 2012; CDP, 2012; Radley Yeldar, 2012; CDP, 2013a) were taken into consideration to develop criteria sample companies should satisfy. From this approach it emerged that companies listed on the Financial

Times Stock Exchange (FTSE) 100 share index[14] fulfil the desired criteria. Not only are a wide cross-section of industry sectors represented[15] that will provide different examples of formalised environmental practice and a broad range of justifications for these initiatives (Nyberg and Wright, 2012), but for several reasons it is arguable that the climate responses of FTSE 100 companies are strategically more important for the UK to meet its emission targets and build adaptive capacity than the more numerous small and medium-sized enterprises (SMEs).

To begin with, due to their size and presence (and other characteristics) FTSE 100 companies have a heightened exposure to associated economic, regulatory, reputational, and physical climate risks and opportunities than SMEs (Agrawala *et al.*, 2011; Haslam *et al.*, 2014), which account for a smaller proportion of the UK's gross domestic product (Okereke, 2007; Baglee *et al.*, 2012). Due to this positionality, how they are impacted will have considerable repercussions for the UK's (and global) economy and societal wellbeing (Jose and Lee, 2007). On top of that, FTSE 100 companies emit substantially more GHG emissions than the rest of the UK business community put together (CDP, 2013a; Committee on Climate Change, 2014) even though at the start of 2014 99.9% of the 5.2 million UK businesses were classified as SMEs (Department for Business Innovation and Skills, 2014). In the past the FTSE 100 has been calculated to contribute approximately 73% of the UK's total GHG emissions (CDP, 2006 in Okereke, 2007), and more recently estimated to emit ten times more (GHG emissions) than FTSE 250 companies (CDP, 2013a). Thus how they respond to climate change is of particular importance to the UK's climate strategy.

Last but not least, FTSE 100 companies have the financial capacity and political weight to setup domestic and global governance standards for responsible business practice. There is evidence that FTSE 100 companies are more engaged in climate change than other groups. CDP (2013) found 84% of FTSE 100 companies set some form of long-term emission reduction target compared to the 58% of FTSE 250 companies. Given this greater capacity and responsiveness, we would expect reporting requirements to be effective in spurring action among this group of very large firms. If, on the other hand reporting requirements have little influence, then this finding would raise questions about the strategy of successive Governments for promoting business engagement with climate change through reporting requirements.

What's more, there are data collection and analysis practicalities to investigating this group. In particular, there is a convenience factor to sampling. If the study investigated SMEs a sampling scheme would have to be carefully devised to ensure a range of companies of equal weighting were investigated. This process can often lead to unnecessary complexity and quickly become time consuming. By choosing the entire FTSE 100 a broad range of sectors will be captured, and there is no need to devise a sampling scheme since all entities are sampled. Moreover, there should be more material readily available to review. FTSE 100 companies have the resources and expertise to

[14] The FTSE 100 is an index that measures the performance of the shares of the 100 largest companies listed on the London Stock Exchange.

[15] Industries include banks, engineering and machinery, food and beverages, home construction, hospitality, insurance, legal services, manufacturing, media and advertising, mining, pharmaceuticals, oil extraction, publishing, retail, supermarkets, telecommunications, and tobacco.

conduct more detailed, in-depth reporting than SMEs (Knox-Hayes and Levy, 2011), as well as being more likely to have websites that provide climate information (Freedman and Jaggi, 2005). Moreover, FTSE 100 companies have a history of publicly disclosing a significant amount of material on social and environmental matters (and their performance) (Gray *et al.*, 1995a; 1995b; Patten, 2002; De Villers and Van Staden, 2006; Jose and Lee, 2007). Whilst this may be due to mandatory commitments—FTSE 100 companies are required to disclose information on social and environmental matters in their Annual report under the Companies Act, and are subject to reporting obligations from regulatory agencies (Freedman and Jaggi, 2005)—they have historically been amongst the most proactive companies to disclose GHG emissions data voluntarily (Jira and Toffel, 2013; CDP, 2013a; Committee on Climate Change, 2014). Thus if these studies are any indication of corporate reporting behaviour FTSE 100 companies are expected to disclose a considerable amount of corporate climate information in the public domain. In addition, by exploring the FTSE 100 there is scope for additional research by comparing the findings of this study with previous (and future) studies that sample the largest companies by equity in different countries (De Villers and Van Staden, 2006). To that end FTSE 100 companies were investigated.

In addition, because the study is also focusing on adaptation reporting (and climate adaptation) alongside carbon reporting (and climate mitigation), in order to compare the two types of climate reporting (see Chapter 1) companies that are subject to climate adaptation-focused regulation were also sampled. In the UK this refers to companies responsible for the UK's critical infrastructure and services upon which daily life depends. That is, critical infrastructure providers of energy (electricity generation, transmission and distribution), transport (aviation, port, rail and road), and water (drinking and wastewater). Like FTSE 100 companies they are particularly vulnerable to projected impacts of climate change because they have a large network of fixed assets, have complex supply chains, and rely substantially on natural resources. If their operations fail the impacts on UK's society are arguably greater than if a FTSE 100 company failed. Their vulnerability has already been experienced with recent winter storms that have disabled their ability to provide the public with key services (e.g., energy, clean water, and transportation), which has caused widespread panic and frustration (The Guardian, 2013; BBC News, 2014; Morris, 2014). Thus, how these companies respond to climate change is also strategically important. Whilst they may not be of the same size, this strategic importance combined with the fact that critical infrastructure providers are also subject to many of the same climate regulations, social pressures, and reporting practices as FTSE 100 companies, makes it necessary to include them in the sample universe.

In sum this resulted in a 176 company sample, the names of which are listed in Appendix A.

3.4 Conducting the research

Building on previous similar studies (Arnell and Delaney, 2006; Berkhout *et al.*, 2006; Spence, 2007) a qualitative-based approach—consisting of a desktop review, multi-case study, and third party conversations—was employed (Figure 3-1) to make sense of new phenomena when little is known

(McKeown, 2004). The characteristics (e.g., purpose, target, source, and data collection technique) of the different components of this qualitative approach are summarised in Table 3-a.

Table 3-a: Summary of the study's qualitative approach to data collection

Component	**Purpose**	**Target**	**Source**	**Data collection technique(s)**
Desktop review	To measure broad trends in climate reporting by UK-listed companies	176 corporate business organisations	Annual reports, corporate websites, and other corporate documents	Document analysis
Multi-case study	To understand the drivers for, practices, and impacts of the broad trends in climate reporting identified from the desktop review	4 purposefully selected sectors, 4-5 companies per sector	1-4 individuals per company	Interviews Document analysis
Third party conversations	To collect data on UK climate policy, and test perspectives developed from the previous phases	4 purposefully selected stakeholder groups	7 Government officials 4 Regulators 4 Consultants 3 Independent body organisations	Interviews

The collection of data through the three iterative components (listed in Table 3-a) occurred over a 16-month period (from June 1, 2013 to September 30, 2014). As illustrated in Figure 3-2 each phase informed the selection of an appropriate unit of analysis and generated a set of possible research themes to explore in the other components. That is, what was learned during the desktop review's scoping and screening exercise helped determine the content and extent of the research protocols for multi-case study and third party conversations components. Likewise, findings from the multi-case studies assisted with the focus and purpose of the third party conversations, but also identified additional analytical issues to be explored in further desktop review work. While the third party conversations informed where areas of data collection should be revisited in the multi-case study and desktop review.

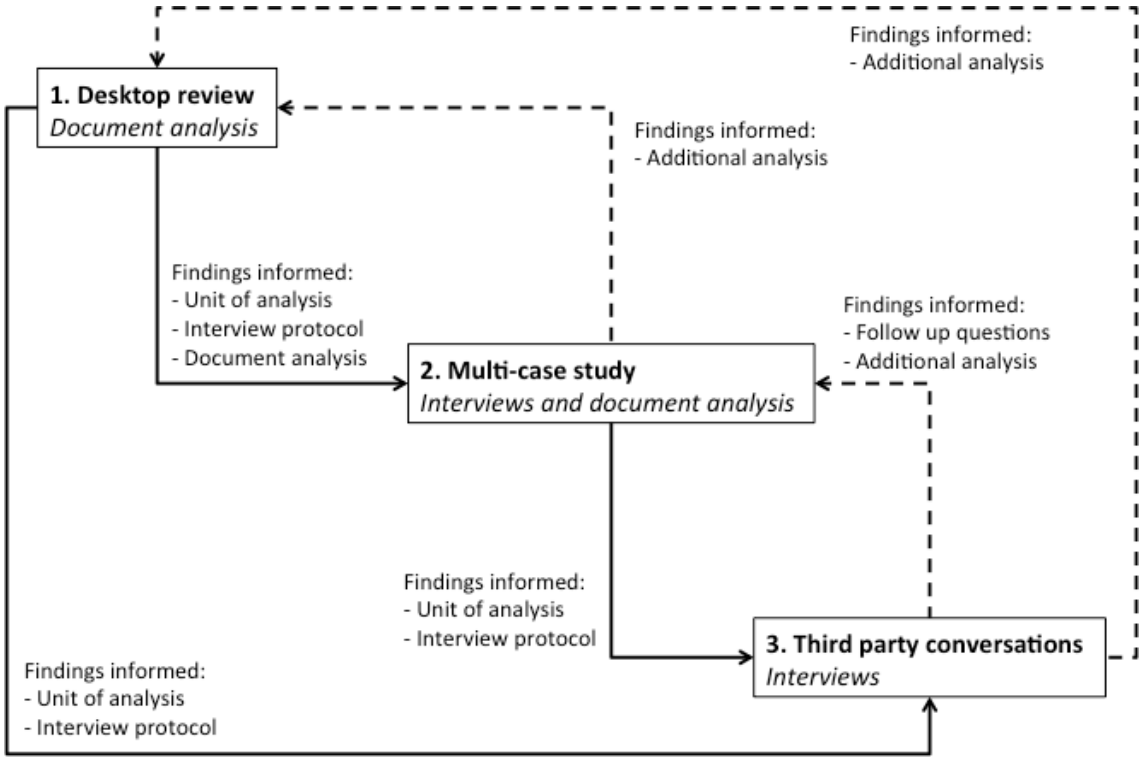

Figure 3-2: The main information flows between each component of data collection

The research protocols of each component of the qualitative approach listed in Table 3-a are discussed in detail hereafter. Particular attention is given to the purpose of the component, its unit of analysis, source of data, and the data collection techniques employed.

3.4.1 Desktop review

The purpose of the desktop review was to measure broad trends in climate reporting by UK-listed companies in order to begin explaining organisational reporting perspectives for climate reporting. A critical and extensive review of the corporate website, and the latest (calendar year 2013) Annual report and other corporate documents (e.g., CSR report) of the entire sample (n176) was performed to obtain available climate information they contain[16]. Previous research investigating corporate financial, social, and environmental reporting practices indicates that these sources are the most important and direct avenues companies utilise to communicate a view of its operations to the public (Campbell *et al.*, 2003; Crowther and Rayman-Bacchus, 2004; Perrini, 2006; Agrawala *et al.*, 2011; Crowther, 2012). Therefore, if companies are reporting (i.e., publicly disclosing) anything about climate change there will be some reference to it in these sources. At the same time all three sources are freely available to examine, are regularly updated (the website most regularly), and allow for climate information to be reconciled with financial information (Patten, 2002; Deegan *et al.*,

[16] It is important to note that only material made directly available on the corporate website, Annual report or other corporate documents was collected. Any material related to a company but not found in one of these sources was ignored. This decision was made because an aim of the study is to determine why certain pieces of information are publicly disclosed and others not.

2002; Freedman and Jaggi, 2005; De Villiers and Van Staden, 2006; Perrini, 2006; Cho and Patten, 2007; Hassan and Ibrahim, 2012;).

While Annual reports, corporate websites, and CSR documents often disclose similar if not identical information each was analysed because of nuances in their audiences and purpose. First, these sources have traditionally addressed different audiences. Whereas Annual and CSR reports speak to shareholders and investors, corporate websites communicate to a much wider lay and environmentally concerned audience (Campbell *et al.*, 2003; Crowther and Rayman-Bacchus, 2004; Crowther, 2012). Second, sources have traditionally provided different quantities and levels of social and environmental information. In Annual reports, included information is a small proposition of the company's social and environmental activities and reporting. CSR reports disclose more specific and in-depth social and environmental information but remain restricted by the cost of reporting. Whilst disclosing information on the corporate website helps address this issue as companies have fewer, if any, rules and financial restrictions on the content, format, and extent of disclosure, enabling them to disclose more, visualise information better, and update it more regularly (Campbell *et al.*, 2003; Crowther and Rayman-Bacchus, 2004; Crowther, 2012); as well as an opportunity for a company to communicate business performance in more favourable ways than it is in reality (Matisoff, 2012; 2015).

Using these sources the desktop review had two steps. The first step identified all of the places where climate information is disclosed in these sources. 176 corporate websites and their respective latest Annual and CSR reports were manually systematically reviewed. That is, all of the webpages on the website and pages in corporate documents are read manually to identify terms, figures and infographics related to climate change. This was supplemented by a search engine enquiry in each source for specific key words related to climate change. Some key words include: 'climate change'; 'global warming'; 'carbon emission'; 'carbon dioxide', 'carbon footprint', 'GHG emission', 'mitigation'; 'mitigating'; 'mitigate'; 'energy efficiency'; 'renewables'; 'adaptation'; 'adapting'; 'adapt'; 'resiliency'; 'vulnerability'; 'business continuity'; 'contingency planning'; 'extreme weather'; 'flooding'; and 'drought'.

The second step focused on the nature of and meaning of what was disclosed rather than quantitative analysis of volumes or frequency. That is, content analysis was employed to focus on the substance of what is disclosed rather than counting the lines of disclosure – a practice performed in numerous studies investigating corporate social and environmental reporting practices (Patten, 2002; Freedman and Jaggi, 2005; De Villiers and Van Staden, 2006; Cho and Patten, 2007; Hassan and Ibrahim, 2012; 2013). To perform this step sources were reviewed systematically, analysed and coded in terms of themes in a checklist. The checklist was developed from the first step of the desktop review, literature, and a pilot study of thirty companies. Initial analysis complied a list of questions linked with climate change risks, opportunities, activities and policy (e.g., carbon footprinting, GHG emissions, enhance the weather capacity of infrastructure), and more general environmental management practices (e.g., waste management, recycling). Notably with the aim of the desktop review to determine broad corporate orientations (e.g., patterns and discourses) of

climate reporting, the trend in reporting over time was not explored nor was the quality of reporting evaluated. Climate information that appeared in two thirds of the pilot samples corporate documents and websites was refined and grouped into similar topics to create four analytical categories (listed in Table 3-b).

Table 3-b: Four analytical categories to review Annual reports, corporate websites, and other corporate documents

Theme	Focus	Data collection questions
One	Descriptive data	Industrial sector Main operating activities Associated companies and brands Regulators
Two	Extent of climate disclosure	Quantity of disclosure Where is climate information located? Is there a climate change webpage, heading and/or section?
Three	Content of climate information	Is climate change a priority in the environmental statement/policy? Do they have climate targets? Climate risks and opportunities? Climate measures 1. Mitigation-related measures 2. Adaptation-related measures
Four	Climate regulation, standards and awards	Mandatory climate reporting requirements? Voluntary climate reporting practices?

Theme one collected descriptive data on the company's industrial sector, associated companies and brands, primary regulators, and main operating activities (Table 3-b). Collection of this data identified which sectors were represented in the sample, and enabled comparative analysis of multiple sectors (e.g., Energy companies versus Water companies versus Finance companies) to be performed to determine reporting variations between sectors. The identification of primary regulators helped inform which agencies should be approached for third party conversations (Figure 3-2).

Theme two categorised how much climate information was disclosed, and where on corporate websites and documents such data was found (Table 3-b). Specifically, it determined the level of disclosure for each company based on the quantity of material made publicly available, and whether climate information was located under headings, sections and/or webpages that discussed general corporate social and environmental matters (e.g., termed 'Corporate Responsibility', 'Sustainability', 'Sustainable Development', and/or 'Environment') or those that focused specifically on climate change. By categorising climate information in this way it was possible to develop an insight into a company's stance towards climate change. That is, whether they consider it a strategic priority, a

corporate issue requiring its own section of explanatory information, or if it is a social issue they are required to talk about because of stakeholder and regulatory pressure.

Theme three focused on the content of climate information, with particular attention paid to the language of disclosure to determine discourses of reporting and corporate climate activities (Table 3-b). Investors are said to look for language and phrases that denote energy efficiency and renewable energy and technology (Solomon *et al.*, 2011). The citation of these and other similar terms maybe an indicator for why companies report. At the same time, Carbon Clear's (2014) research suggests while FTSE 100 companies set climate targets, the vast majority do not demonstrate clear, strategic approaches in their reporting. Some base targets on climate science to demonstrate robustness and solid reasoning, whilst others will just provide targets. Differences in reporting content and styles might suggest differences in purpose. To that end, specific climate risks and opportunities were noted, as were corporate targets related to tackling climate change (e.g., reduce GHG emissions by 20% by 2030), and any evidence (direct and indirect references) of climate mitigation (e.g., reducing GHG emissions through energy efficiency, renewable power, and cleaner vehicles) and adaptation measures (e.g., recognizing and preparing for impacts like water stress, coastal flooding, community health issues, or supply chain disruptions, among other issues) being undertaken. Collection of this information helped generate general sector climate reporting characteristics that was used to compare sectors.

Theme four documented the mandatory and voluntary types of climate reporting companies do (Table 3-b). The purpose behind collecting this data was to establish what, if any, relationship there is between climate reporting and the implementation of climate measures. Both mandatory and voluntary reporting aim to trigger corporate responses to climate change and increase the number of companies actively reducing their GHG emissions, and managing their climate risks and opportunities. Reporting is also geared towards better informing shareholders and institutional investors to make decisions based on included information. Analysing these signalled potential links and conflicts between reporting and decisions to implement climate measures that was then explored in more detail in the multi-case study component (Figure 3-2).

These four analytical categories will allow for some broad quantification of patterns in climate reporting. In particular, they will help determine where, when and how often UK-listed companies do climate reporting.

3.4.2 Multi-case study

In order to contextualise and explore the underlying reasons (i.e., how and why) for the findings of the desktop review an intensive exploratory multi-case study was performed to accumulate first-hand accounts on a company's climate perspective from its employees. In particular, this component of the qualitative approach sought to obtain and understand organisational motives (i.e., internal and external factors) that affect decisions to engage with (or not) climate change and to report about it externally because motives are linked to the ingrained organisational cultures and behaviours that do not exist or arise randomly or haphazardly, but instead are organised in

integrated coherent structures or systems (Schwartz, 1994; O'Brien and Wolf, 2010). Applying a multi-case study technique is particular useful for determining the dynamics and relationships present within single settings, as well as answering 'how' and 'why' questions (Hagg and Hedlund, 1979; Eisenhardt, 1989; Savage *et al.*, 2000; Yin, 2003; Berry and Otley, 2004; Scapens, 2004; Yin, 2008), which clearly need further examination in corporate climate reporting literature. Moreover, performing a multi-case study can help overcome potential analytical challenges that may arise from the localised and context-dependent nature of climate change and corporate responses to it. This is possible because multi-case study research "is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin 2003, p.13). The technique "relies on multiple sources of evidence, with data needing to converge in a triangulating fashion" (Yin, 2003, p.14) to develop explanations for observations. Indeed, it has been previously utilised to demonstrate "how theoretical conclusions (analytical generalisations) are generalisable and provide valuable perspectives into contemporary phenomena" (Pellegrino and Lodhia, 2012, p.71).

For the same reasons enumerated by Gasbarro (2013, p.115), cases were selected "in order to allow an analytical generalisation of findings through a literal and theoretical replication, ensuring the possibility of discovering similarities among the cases, and to predict contrasting results for predictable reasons (Yin, 2002)". The former is achieved because all 176 companies studied have:

a) existing or potential sensitivity to climate variability and change, but are able to overcome many climate issues;
b) the ability (economically and technologically) to significantly tackle climate change directly and indirectly;
c) a big influence on the UK's society and economy (e.g., market capitalisation and employ a large workforce); and
d) the resources to support detailed reporting.

These similarities between sampled companies provide a control of sorts which make them comparable. To allow the latter, for comparative and contrasting analysis, companies with different core sector characteristics were chosen for case-study analysis, whereby a degree of variation exists between their:

1) Level of environmental sensitivity (e.g., low to high);
2) Energy intensiveness (e.g., low to high);
3) Primary business operations (i.e., resource-based, service-based, or joint resource-service);
4) Whether they are independently economic regulated (e.g., yes or no); and
5) Whether they are a critical infrastructure provider (e.g., yes or no).

Variation in these particularly sector characteristics has been shown to affect corporate responses to social and environmental matters (Trucost plc, 2004; Ihlen, 2009), and is recognised as potential influences on climate decision-making (Kolk and Pinkse, 2001; Berkhout *et al.*, 2006). For instance, sectors with high environmental sensitivity to changes in their key resources (and environmental

regulation) tend to disclose more detailed social and environmental information than sectors with low environmental sensitivity (Meek *et al.*, 1995; Deegan and Gordon, 1996; Patten, 2002). A similar dynamic has been found in energy intensive sectors that appear to disclose greater quantities of environmental information than non-energy intensive sectors (Jose and Lee, 2007). It is possible that both outcomes will also occur in regard to climate reporting. While climate change will impact all sectors, each faces unique challenges because of their business operations and the types of goods and/or services they provide (Ford *et al.*, 2010; Agrawala *et al.*, 2011; Nyberg and Wright, 2012). Resource-based companies have tended to engage with environmental sustainability more frequently than service-based industries because of the long-term nature of their infrastructure and assets that will be exposed to a variety of different climatic conditions as well are potentially vulnerable to social and economic changes in the future. By contrast service-based companies have previously been shown to cite their business activities as a rationale for not measuring or taking action on their GHG emissions (Kolk and Pinkse, 2001).

In addition, certain sectors in the UK are subject to independent economic regulation, which aims to promote effective competition where natural monopolies occur to protect consumers' interests (BIS, 2011). Regulation has typically capped the prices that dominant companies can charge in order to promote efficiency and fairness, while providing them a return on their assets and investments. In doing so, these regulators have delivered significant benefits to consumers. This additional governance may have bearing on how certain companies respond to climate change because they often have to provide their regulator with a business strategy for a set period of time that outlines among other plans how they will tackle the challenges of climate change (Bakker, 2000; Berkhout *et al*,. 2006; Arnell and Delaney, 2006; Wilby and Vaughan, 2011). Moreover, certain sectors are classified as providing infrastructure and services that are essential for the functioning of a society and economy. How these companies respond is particularly important for the UK's ability to cope with climate change challenges.

Due to these sectoral conditions companies participating in the multi-case study component were purposefully selected rather than for statistical reasons. From these criteria four sectors were identified: Energy utility, Extractive (industries), Financial service, and Water (utilities). Based on academic and grey literature (Kolk and Levy, 2001; Kolk and Pinkse, 2001; Dunn, 2002; Ford *et al.*, 2010; Agrawala *et al.*, 2011; Baglee *et al.*, 2012; Nyberg and Wright, 2012; Gasbarro, 2013; Haigh and Shapiro, 2013; Varnäs *et al.*, 2013; DECC, 2015) it is possible to create Table 3-c that summarises each sectors unique characteristics in regard to the criteria.

Table 3-c: Summary of the case-study sector's unique characteristics

Sector	Level of environmental sensitivity	Energy intensiveness	Business operations	Independently economic regulated	Critical infrastructure provider
Energy utility	High	High	Joint resource-service	Yes	Yes
Extractive	High	High	Resource-based	No	No
Financial service	Low	Low	Service-based	No	No
Water	High	Medium to high	Joint resource-service	Yes	Yes

These unique characteristics were used to provide structural variables to explain any differences in patterns of reporting and responses to climate change. In addition, each sector has documented management issues and concerns highlighted in recent national reports and grey literature. Therefore these sectors merit attention not only to mitigate and adapt their own operations to climate change, but also to facilitate mitigation and adaptation for society.

To improve reliability in the study's findings multiple firms per case-study sector were sampled (Table 3-a). If only one firm per sector is investigated it is difficult to know if the findings are particular to the firm or more typical of the sector. If multiple firms per sector are investigated it is possible to triangulate findings to generate a general sector perspective, whereby findings frequently appearing are likely to be sectoral traits, and infrequent findings can be assumed to be unique to the company in question. The same can be said about developing each company's perspective. If only one individual per firm is interviewed their responses may be more indicative of their beliefs than of the company's values. Therefore, to capture a true account of a company's climate perspective semi-structured interviews were conducted with a range of individuals from different business functions within each case study firm. By collecting a cross-section of perceptions data can be cross-verified to establish if responses are a fair reflection of the corporate agenda. In addition, given the nature of the topic, the potential of interviewing a series of climate champions with similar perspectives is particularly high. Interviewing individuals from different business functions minimises the chances of this happening. Thus the intensive multi-case study phase had three levels—sector, company, and employee—whereby each level used source and method triangulation to ensure the reliability of data.

Recruitment of companies was based on random sampling. All companies in each case-study sector that are within the sample were contacted about participating. The names and contact details were obtained from publicly available phone and email lists on corporate websites. Initial contact,

by telephone, identified a relevant point of contact within the company that the study could be briefly introduced to. This step was taken because of the cold calling recruitment approach used, whereby contact is made with an individual (perspective participant) not expecting to be contacted for research purposes. By briefly introducing prospective participants to the study it improves the likelihood of participation (Dillman, 1978; Valentine, 2005). Immediately after this initial contact a follow up email was sent to outline the study's aim and objectives in more detail, justify and reiterate the importance of participating, explain ethical considerations (details on data protection and management), and provide exemplar interview questions. To further enhance participation rates a degree of persistence was built into the recruitment process (Dillman, 1978; Valentine, 2005). Specifically in the event of no response confirming a willingness or non-willingness to participate, individuals were re-contacted two weeks after initially contact. If a further two weeks went by with no response a telephone call was made to ascertain a new point of contact or re-establish an existing relationship. No response after six weeks was accepted as a sign of no interest. Interviews were conducted at a time and place that suited participants' work commitments. A tape recorder was used, with King's College London's confidentially and data management protocols followed strictly.

In terms of recruiting multiple individuals per company a snowballing approach was applied. At the end of interviews, participants' were asked to pass on contact details of colleagues in different company business functions that they considered were vital to talk to or would be willing to participate. Thus one contact was used to identify and recruit another participant, who in turn was asked to identify someone else. Through this approach identification and recruitment of participants gained momentum as layers of contacts were built up (Valentine, 2005). Though chances of participant bias (e.g., contacts may pass on details of like-minded colleagues) are higher, the approach improves participation rates as contacts recommend your work as worthwhile.

This resulted in a sample population of 36 individuals representing 19 companies (across five sectors). Table 3-d organises the sample population by sector and the number of interview participants per company. To encourage honest and accurate responses and accounts, and to address potential ethical issues, participating companies and interviewees were anonymised. Interview participants were given a confidentiality agreement (see Appendix B) to sign that outlined the aim of the study; that they can withdraw at anytime; that the data will be stored in the UK Data Archive, and their interview will be recorded to aid later (verbatim) transcription (explained in '3.5 Analysing the Data'). Therefore, data cited from interviews in the study is given a code name made up of the sector, company and interview number (e.g., Energy A, Interview 1).

Table 3-d: Summary of the number interview participants per company in each case-study sector

Sector	**Company**					
	A	**B**	**C**	**D**	**E**	**Total for sector**
Energy	4	3	2	1		**10**
Extractive	2	2	1	4	1	**10**
Finance	2	1	1	1	1	**6**
Water	2	2	2	3	1	**10**

Notably, whilst this approach was largely successful, as shown in Table 3-d, like Stubbs *et al.*, (2013) experienced, it was sometimes difficult to identify more than one appropriate person that had the time to participate. For some companies, mainly in the Financial service sector (Table 3-d), only one individual was interviewed despite multiple attempts to persuade others to participate. In addition, though a range business functions are represented (as summarised in Table 3-e) individuals working in the Corporate Environment business function were most willing to take part. This may suggest a bias in the study.

Table 3-e: Business functions and job title for interview participants (includes pilot study interviewees)

Business function	**Job title**	**n**
Executive Committee	Company Secretary	1
Environment (Includes climate change, sustainability, and corporate social responsibility teams)	Vice President/Director of Sustainability/Environment/Climate Change	2
	Managing Director of Environment	1
	Head of Sustainability and Innovation	1
	Climate Change/Sustainability Strategy Manager	6
	Group Environment/Corporate Responsibility Manager	3
	Climate Change/Sustainability Analyst	1
	Group Sustainability Officer and Reporting Lead	1
	Sustainability Awareness Advisor	1
Policy and Regulation	Global Senior Advisor on Energy, Security and Climate Change	2
	Chief Advisor Energy and Climate Change Policy	1
	Lead Advisor on Carbon Regulation and Research Advisor	2
	Team Leader on Regulatory Compliance	1
Energy	Energy Reduction Advisor	1
	Energy Generation Analyst	1
Facilities and Estates	Head of Facilities and Business Continuity	1
	Energy Services Manager	2
Supply Chain	Group Supply Chain Strategy and Performance Manager	1
Procurement	Senior Procurement and Supply Chain	1
	Senior Sustainability Analyst in Global Procurement	1
Finance	Management Accountant	2
Health and Safety	Manager Legislative Compliance and Social Responsibility	1
Marketing	Communications Officer for Government and Stakeholder Engagement	1
	Communications Officer for Corporate Responsibility and Reputation	1

Consequently, to further check the consistency and validity of interview responses additional documentary data was collected from companies that participated in this component of the research. In particular, any corporate-related policy and technical reports available on the corporate website such as submissions to voluntary climate reporting indexes, the Government and Regulatory agencies, and key strategy documents were analysed. This helped further triangulate data to determine if recognised practices are actually being applied throughout their business operations.

In regard to the interview, the protocol followed the framework outlined by Valentine (2005). It consisted of a series of carefully designed probing open-ended questions that elicit extended responses rather than 'yes' or 'no' answers, so as to gather authentic, multi-layered, rich and

sometimes complex insights into a company's experience. Questions were identified from the findings of the desktop review and academic and grey literature. After a period of idea generation, questions relevant to the research aim and objectives were chosen, ordered and structured into a draft topic guide. To ensure questions were sound and drew the intended responses (Cloke *et al.*, 2004) a pilot study was carried out. Questions appearing inappropriate and not collecting relevant data were reviewed and revised. They were then re-tested and checked to see if they identified novel issues. This resulted in a topic guide (presented in full in Appendix C) with questions falling into five themes (as listed in Table 3-f).

Table 3-f: Summary of interview topics

1. Background on interviewee and company represented
2. Understand the company's general approach to non-financial reporting
3. Distinguish the company's climate change perspective
4. Probe the company's practice of climate reporting
5. Determine to what end reporting serves

The first theme, before more specific questions, asked participants to briefly explain the main responsibilities of their job, and what business function they represent (Table 3-f). While this data enabled categorisation of interview participants, the purpose of these scene-setting questions was to help build rapport and encourage participants to talk more freely (Longhurst, 2003; Valentine, 2005).

The second theme attempted to learn about the company's general approach to non-financial reporting (Table 3-f). Specifically the mechanisms and processes: who is responsible for collecting and interpreting data; where is data collected; why do they report; what purpose does it serve? This data helped determine the validity of publicly cited reasons for and discourses of environmental activities – if it is a true reflection of the company. Understanding this provided an insight into how companies use forms of non-financial reporting to communicate a certain corporate image.

The third theme intended to define what climate change meant for the company (Table 3-f). In particular, whether they had been affected by recent of historic weather events; if climate change is a business priority (and what influenced this stance); what the principal climate risks and opportunities are; what climate mitigation and adaptation measures the company is undertaking (and why); and if climate targets are set for the business as a whole and/or each function, and who is responsible? This data served multiple purposes, chief of which was to identify different corporate orientations to climate change. This enabled a sector perspective to be generated and in turn comparative analysis to be performed. In regards to other uses the data helped identify broad patterns in and discourses of reporting; as well as differences in the application of climate mitigation and climate adaptation in the business community.

The fourth theme focused on the practice of climate reporting (Table 3-f). The frequency and diversity of reporting (e.g., mandatory and voluntary), and how they report – particularly thinking about the workload, time taken, financial cost, individuals involved, sources of data, and the use of

guidelines, climate information and specialist advice. This data not only helped determine different types and approaches to climate reporting (between companies and sectors), but also began to gesture why companies report in the first place as interviewees implicitly provided rationales for different types of reporting performed. In addition, there was some insight into decision-making as responses reflected on why certain data was included and other data not.

The fifth theme tried to understand what purpose climate reporting serves the company by collecting data on how climate information is used in the decision-making process (Table 3-f). Whether reporting informs the daily management of business operations, short-term goal setting, and long-term strategy planning. Responses informed why companies report in the first place by identifying the main internal rationales and external influencing factors on their climate reporting practice.

Notably, whilst all participants responded to the same set of questions to improve comparability of responses (Kitchin and Tate, 2000), the order in which they were asked, and how they were phrased was tailored to the situation. The topic guide was primarily used to help manage the interview. It helped inform what questions have been asked or need to be revisited; included prompts that could be used to help encourage participants to respond when they were having difficulty to elaborate their perspective; and pre-determined the researchers dialogue to avoid articulation of views, values and beliefs about a topic or to a participant's response (Kitchin and Tate, 2000; Longhurst, 2003; Marks and Yardley, 2004; Valentine, 2005). Furthermore, although a topic guide was used spontaneous discussion of relevant tangent emergent themes was encouraged.

3.4.3 Third party conversations

In order to better understand corporate decision-making – and to a produce a more complete analysis and discussion – supplementary data was collected on the social, economic and political factors identified in the desktop review and multi-case study components. Specifically third party perspectives were collected on the UK's domestic climate policy and approach to tackling climate change; the different types of climate reporting (e.g., mandatory and voluntary) companies do; the sources of climate information and expertise companies utilise; and the influence they and other stakeholders have on corporate environmental management.

Participants were identified from the desktop review and multi-case study (Figure 3-2), whereby the most frequently cited names of key stakeholders companies interact with were noted and approached in a similar fashion to that of the multi-case study. In total 24 semi-structured interviews were conducted with individuals representing stakeholder groups that have the ability to directly and indirectly influence corporate reporting practices and decision-making. Insofar they devise mandatory and voluntary forms of climate reporting companies are responding to, and/or provide impartial, evidence-based advice to inform others about best or better practice. Four stakeholder groups are of particular importance: the Government officials, Regulator agencies, Consultants, and Independent body organisations. Table 3-h summarises the number of entities per stakeholder group, and number of interviewees per entity sampled.

Table 3-g: Summary of the number interview participants per entity in each stakeholder group

Stakeholder group	A	B	C	D
Government official	4	4	1	1
Regulatory agency	3	1		
Consultant	3	1		
Independent body organisation	1	1	3	1

'Government officials' debate, write and implement domestic climate policy and the majority of mandatory reporting requirements companies are subject to (Table 3-h). Speaking with individuals accountable for leading climate mitigation and adaptation provided an insight into the intended purpose of climate regulation, and highlighted examples of perceived good and bad corporate practice. This information allowed for a more thorough investigation about the potential role domestic climate policy and regulation plays in encouraging corporate business organisations to transition to a low-carbon and sustainable future.

'Regulator agency' included individuals currently working in UK agencies (e.g., Ofgem, and Ofwat) whose job is to be certain corporate business organisations act fairly and follow rules by exercising autonomous authority in a regulatory or supervisory capacity (Table 3-h). Like the Government, regulators help govern behaviour of business by enforcing a whole host of standards and safety criteria companies must comply to. Part of their aim is to ensure products and services work more effectively to ensure consumers get a fair deal. This is achieved by insisting upon transparency of information and decision-making, requiring companies to give reasons explaining their actions, request companies follow principles that promote non-arbitrary and responsive decisions, and review policy documents. Thus the benefit from speaking to Regulator agencies highlighted external policy documents and environmental regulations that may affect corporate climate decisions.

'Consultant' included individuals who represent boundary agents and knowledge brokers that provide specialist advice on a consultancy basis to corporate business and investors about climate policy and best practice for corporate reporting (Table 3-h). For instance, Consultants broker knowledge to companies by assisting in the way climate policy is interpreted and subsequently used in strategic decisions. In addition, consultants assure climate data included in reports. Speaking with these individuals explained how and what advice and assistance companies seek with reporting obligations, as well as provide insight into why expert knowledge was sought.

'Independent body organisations' provide support and advice to business and Government through practice-based research (Table 3-h). By engaging with a wide audience that includes business companies, politicians, consultants, and the public in think tank environments, lessons learned are shared to better inform society about the challenges of climate change. Notably, such Independent bodies are becoming increasingly influential in the climate debate as they are said to

represent the interests of its constituent businesses. Speaking with these individuals helped hone research questions by providing rationales for corporate engagement with climate change.

3.5 Analysing the Data

Before analysing collected data it was complied and converted into a presentable, readable and an analytically friendly format. Insofar, notes made during website reviews, document analysis and interviews were digitised immediately to capitalise on fresh memory of the analysis or conversation (Kitchin and Tate, 2000). In regards to interview recordings they were transferred to a secure location immediately to make ready for transcription the following day. Transcription was verbatim with care to allow for the reconstruction of all the nuances, frustrations, humour and sarcasm (Valentine, 2005). To help reduce the time it takes to transcribe data, a number of general rules were applied, including the use of a dot in parentheses – (.) – to indicate a slight pause, capitals to indicate loud noises, and italics to indicate changes in pitch, among others (see Box 8.7 in Kitchin and Tate, 2000, p.238). Conversations consisted of repetition, hesitation and unfinished remarks. Therefore, to aid readability, mistakes in grammar that are common in speech were corrected. In addition, data (i.e., direct quotes) utilised in discussion used ellipses – […] – where the removal of words made no difference to the meaning of the quote.

In analysing the various sources of data (e.g., website, Annual, and CSR reports) a consistent, systematic approach was employed. A basic content analysis was performed on collected data in order to examine substance and scope (i.e., content and extent). Such an analytical approach has been widely utilised in research looking at social and environmental reporting because it enables multiple sources and methods of data collection to be analysed in a timely manner without compromising the research quality and allowing comparisons to be undertaken (Jose and Lee, 2007). It reliably identifies various well-specified themes that are salient to the research aim and are credible and legitimate reflections of the data being analysed (Kitchin and Tate, 2000; Guthrie *et al.*, 2004). Notably, to aid analysis SPSS and NVivo were used to code and analyse data collected in the desktop review and interviews respectively. Both software tools enable the comparison of large amounts of data (Gasbarro, 2013). In particular, SPSS was used to explore the scope and patterns of climate information disclosed publicly by companies on their corporate website and in corporate documents. A range of descriptive and inferential statistics (e.g., measures of central tendency, and hypothesis testing) was performed to determine how different sectors compare to one another. In regard to NVivo, the software was used to evaluate similarities and differences between interview responses across the sample. Interview transcripts were systematically reviewed to identify trends and relationships in the data.

The following analytical procedure was employed. Initially collected data (e.g., interview transcripts and website/document analysis notes) was systematically reviewed with open coding applied to instances in text that closely related to the research aim and objectives. After this initial analysis was completed emergent patterns in the data were identified with any recurring codes

noted more formally as theoretical memos (Crang, 2005; Gasbarro, 2013). Large cumbersome themes were either refined or removed all together in light of new experiences or as ideas developed. Throughout analysis and write up themes were subject to on-going evaluation to ensure they were internally consistent, conceptually related, and analytically useful (Kitchin and Tate, 2000). The aim was to scrutinise the data to allow relationships (similarities and differences) to emerge within themes and across the range of themes. To understand the nature of relationships – "how things are associated and how things interact" (Kitchin and Tate, 2000, p.247) – comparative analysis was performed to identify links. These sources of information were then pieced together to try to determine an outcome. Notably, there was a possibility for misinterpretation of data. The researchers' own interpretation can heavily influence how data is grouped and what the subsequent findings are. Therefore, corroboration was applied by cross-checking and triangulating evidence from the different methods of data collection to enhance integrity and validity of the findings (Kitchin and Tate, 2000).

3.6 Summary: Linking the Research Design to the Research Questions

This chapter has outlined the critical realist epistemological and ontological orientation of the research, the sampling strategy—sample universe, recruitment process, and data collection techniques—and the analytical approach. How this research design formulated research findings is visualised in Figure 3-3, which illustrates the links and flows of information between the different data collection techniques employed and the research questions being investigated.

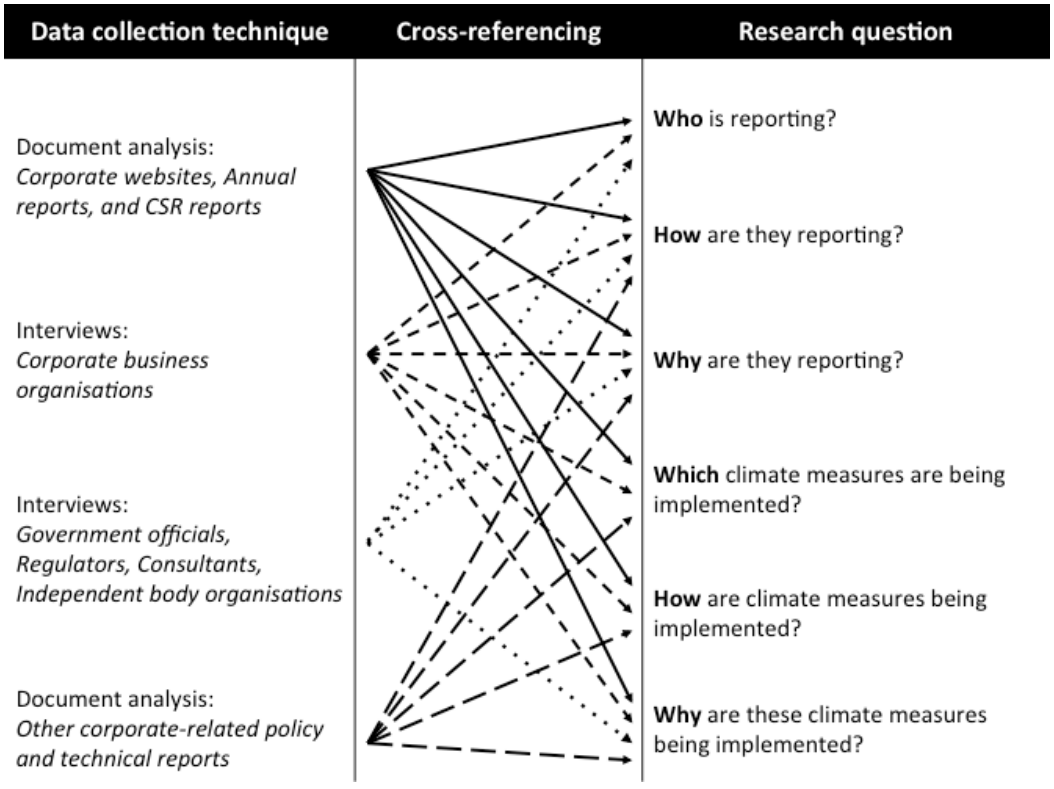

Figure 3-3: Linking data collection techniques to research questions

In sum, Figure 3-3 reiterates that for every research question three or more sources of data are drawn upon to ensure a more complete and accurate picture is established. Whilst data collected from the desktop review (e.g., documents analysis of corporate websites, Annual reports, and CSR reports) and interviews with company employees formed the basis for the answers offered to every research question, additional evidence from third party interviews and/or document analysis of other corporate-related policy and technical reports were used where appropriate to support or contest. For example, to determine 'Who is reporting?' (Figure 3-3) document analysis and corporate interviews was supported by third party interviews with Government officials, Regulators and Independent body organisations to identify which companies are reporting. These interviews also provided an indication of 'Why are they reporting?', 'Which climate measures are being implemented'?, and 'Why are these climate measures being implemented?' because they indicated which mandatory requirements and voluntary indexes companies participate in and whether they are obligated to implement certain climate measures. Similarly, speaking with Consultants helped identify which companies have been assisted with the reporting process ('How are they reporting?') and sought specialist advice on implementing climate measures ('How are climate measures being implemented').

Chapter 4 UK Climate Policy: Approach and Governance

4.1 Introduction

The UK is an active protagonist in the International climate change debate (Lorenzoni *et al.*, 2007; Bowen and Rydge, 2011). The UK strongly supports International climate negotiations through the United Nations Framework Convention on Climate Change[17] (UNFCCC) and EU channels, as well as the scientific findings of the Intergovernmental Panel on Climate Change[18] (IPCC). Whilst nationally a climate change framework—governed by the Department for Environment, Food and Rural Affairs (Defra) and the Department of Energy and Climate Change (DECC)—has long been established that consists of: an advisory panel made up of economists and scientists; multiple climate policies, initiatives and taxes (e.g., The Green Deal[19]); Government commissioned reviews (e.g., Stern Review[20]); funding of climate science research institutions (e.g., Met Office Hadley Centre); production of climate science information (e.g., UK Climate Change Projections 2009[21]); and the provision of climate change advice provided by public bodies (e.g., Environment Agency's Climate Ready service[22]).

Even though the components and mechanisms of this framework have evolved overtime its purpose has remained the same, to show leadership in tackling climate change (Darkin, 2006; Carter and Ockwell, 2007). This political commitment has implications for the way in which the UK's public and private sectors operate. Through climate regulation the Government tries to shape and control public and private sector activity to the benefit of its climate change agenda. Equally though, responses of the public and private sectors drive the Government's climate framework (Jones and Levy, 2007; Patenaude, 2011; Linnenluecke and Griffiths, 2010; Amado *et al.*, 2012; Berkhout, 2012; Linnenluecke *et al.*, 2012; Gasbarro, 2013). Given this relationship, it is important to critically reflect on how the UK's climate change framework is currently shaping (or attempting to shape) corporate responses to climate change. In order to perform this task the chapter will explore the history of UK climate policy and introduce some of the main mandatory reporting

[17] In 1992 the UNFCCC was created to act as a vehicle for preventing dangerous warming from GHGs and set voluntary targets for reducing emissions. 197 nations are signatures; see http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php. Date accessed December 1, 2015.

[18] The IPCC is a scientific authority set up by the United Nations in 1988 to analyse and report scientific findings relating to climate change. The IPCC has repeatedly warned strong measures are required to reduce the rate of climatic change.

[19] More information available at: https://www.gov.uk/green-deal-energy-saving-measures/how-the-green-deal-works. Date accessed 29, January 2013.

[20] More information available at: http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/sternreview_index.htm. Date accessed 20, January 2013.

[21] The UK Climate Change Projections 2009 are state-of-the-art free for use climate projections of future changes in the UK. For more information see http://ukclimateprojections.defra.gov.uk/. Date accessed 14, January 2013.

[22] For more information see http://www.environment-agency.gov.uk/research/137557.aspx. Date accessed 28, January 2013.

requirements UK-listed businesses are subject to. It draws upon 24 third party conversations with Government officials, Regulators, Consultants, and Independent body organisations (for see Chapter 3 for further details on data and methods), and an extensive review of Government policy documents and relevant literature.

The chapter consists of three sections. Section one briefly presents the UK's approach to climate policy. It demonstrates how the UK Government has repeatedly introduced aggressive climate policies to support its leadership agenda. Section two discusses how this approach to climate policy and changes in Government and societal thinking led to the Climate Change Act 2008 (henceforth 'the Act') – the UK's legislative framework for climate change mitigation and adaptation. This section begins by outlining the Act's passage to Royal Assent and main provisions. After which, in separate sub-sections, the chapter concentrates on the two climate reporting requirements written into the Act that affect UK-listed businesses: a) the 'Mandatory Carbon Reporting' (MCR), and b) the 'Adaptation Reporting Power' (ARP). Each sub-section will discuss the purpose of the reporting requirement, the business companies affected, what information is collected, and enforcement mechanisms. After mapping out both reporting requirements the chapter, in section three, will discuss how the mode of governance used in their application exemplifies a wider shift in the Government's strategy for governing climate change. In particular, it considers the mechanisms and implications of this shift for the application of both reporting requirements. The chapter finishes by summarising the main points and provides some thoughts on how these two reporting requirements may affect organisational cultures and behaviours.

4.2 The UK's Approach to Climate Policy

Since its policy emergence in the late 1980s climate change has been elevated into "a major driver of public environmental policy" in the UK (Hulme and Turnpenny, 2004, p.105). The "UK has consistently been in the vanguard of developed nations in promoting international action on climate change" (Bowen and Rydge, 2011, p.16), taking a lead in focusing political and economic attention on the state of the climate (Lorenzoni *et al.*, 2007). For example, the UK played a lead role in negotiating the Kyoto Protocol, and used its reign as G8 President to place climate change high on the agenda for the 2005 Gleneagles summit (Carter, 2014).

Key to maintaining this position has been the repeated introduction of domestic climate policies designed to show leadership on climate change internationally (Darkin, 2006; Carter and Ockwell, 2007). Consecutive Government's since Margaret Thatcher's 1988 Royal Society address—where she became the first world leader to voice alarm on global warming—have introduced domestic climate policies that were progressively more ambitious than their predecessor to pioneer action others could follow. For example, in 2000, confident[23] about delivering the designated Kyoto Protocol reduction target (of 12.5% from 1990 levels in the period 2008 to 2012)

[23] The 1980s privatisation of the UK's Energy utility sector had unintentionally significantly reduced GHG emissions. This gave the UK Government a great deal of confidence to set ambitious targets safe in the knowledge they could be realistically achieved.

for all greenhouse gas (GHG) emissions, the Government set a 20% reduction (from 1990 levels by 2010) target for carbon dioxide (CO_2) emissions only. Significantly, at the time, setting targets for specific types of GHG emissions was an uncommon practice, making the UK's commitments innovative and pioneering.

To help meet this emission target the Government introduced a number of mandatory reporting requirements (summarised in Table 4-a) for the UK's public and private sectors that obligates them to engage in climate reporting. That is, public and private organisations must collect and submit certain climate information to a particular Government entity for review (e.g., Environment Agency, Defra, DECC).

Table 4-a: The main mandatory reporting requirements affecting the UK business community[24]

Climate Change Levy (CCL). *2001*. A tax on the taxable supply of specific energy products delivered to non-domestic users. Taxable commodities include electricity, natural gas supplied by a gas utility, liquid petroleum gas, coal and ignite used for lighting, heating and power by business consumers in industry, commerce, agriculture, public administration and other services. It does not apply to energy delivered to domestic users or charities for non-business use. It aims to incentivise energy efficiency and emissions reductions. Energy intensive users are eligible to receive up to a 90% discount if they join the Climate Change Agreements[25] (CCAs).

European Union Emission Trading Scheme (EU ETS). *2005*. Replaced the UK Emissions Trading Scheme. Working on a 'cap and trade' basis, it sets a 'cap' or limit on the total greenhouse gas emissions allowed by all participants covered by the System and this cap is converted into tradable emission allowances.

Carbon Reduction Commitment Energy Efficiency Scheme (CRC). *2010*. Designed to target emissions not already covered by the CCAs and EU ETS. It features a range of drivers to encourage organisations to develop energy management strategies that promote a better understanding of energy usage.

Adaptation Reporting Power (ARP). *2010*. Primarily companies from the Energy utility, Transport, and Water sectors were asked to report on current and future predicted impacts of climate change on their organisation, and their proposals for adapting to climate change.

Mandatory Carbon Reporting (MCR). *2013*. Companies listed on the Main Market of the London Stock Exchange (or in an EEA State, or admitted to trading on the New York Stock Exchange or NASDAQ Stock Market) are required to report their Scope 1 (direct) and Scope 2 (energy indirect) levels of GHG emissions (as defined by the Greenhouse Gas Protocol[26]) for which they are responsible in their Annual (Directors') Report.

[24] For a comprehensive guide of UK climate change policies see "Box 2. A timeline of UK climate-change policies" in Bowen and Rydge, 2011, p. 17-19.

[25] The Climate Change Agreements allow energy intensive firms to obtain a 65% discount from the CCL provided they met energy efficiency improvement or carbon emissions reduction targets. To comply companies must monitor, report and verify CO_2 emissions, but there is no requirement for this information to be disclosed publicly.

[26] The GHG protocol, developed by the World Resources Institute (WRI) and World Business Council on Sustainable Development (WBCSD), sets the global standard for how to measure, manage, and report GHG emissions in three broad scopes. "Scope 1 emissions are emissions from sources owned or controlled by the company (and include the generation of electricity, heat or steam, physical or chemical processing, transport in company owned/controlled vehicles, fugitive emissions). Scope 2 emissions are emissions from the generation of purchased electricity that is consumed in owned or controlled equipment or operations. Scope 3 emissions are emissions from

Notably, these reporting requirements (Table 4-a), and domestic climate policies more generally, have principally focused on reducing carbon emissions by attempting "to price emissions, stimulate the development and deployment of clean energy, and improve energy efficiency" (Bowen and Rydge, 2011). The CCL, EU ETS, CRC, and MCR all mandate large public and/or private sector organisations to do carbon reporting, whereby they must report their emissions data, and explain how they are reducing these. Only the ARP requires companies to do adaptation reporting, whereby they must report their climate risks and opportunities, and explain how they are planning to cope with these. For Bowen and Rydge (2011) this approach has led to an underdeveloped policy agenda promoting efficient climate adaptation in the UK. This bias for carbon-focused mandatory requirements allows for speculation about the extent of carbon reporting and adaptation reporting in the UK business community. It is argued that being mandated to report is a first step for engaging entities with an environmental issue (Jones and Levy, 2007; Kauffman *et al.*, 2012; Gasbarro, 2013). Indeed, this was reflected by 10 of 24 third party stakeholders, as exemplified by this response about mandatory reporting requirements:

"I think it will be good. It will get them thinking." (Consultant B, Interview 1)

This is because mandatory requirements are seen to be important drivers for reporting and action as they establish a remit for companies to operate in that would not otherwise exist. Given the bias for carbon-focused mandatory requirements, it is anticipated that companies will be more commonly doing and familiar with carbon reporting than adaptation reporting. This will be explored in the next chapter.

A major reason for this carbon bias is due to the fact that for some time it was politically incorrect to even discuss climate adaptation as a primary response option. It was perceived that by developing adaptation policies Governments' (and its societal stakeholders) were accepting defeat and (human) responsibility for climate change, which would subsequently make them prone to discussions of liability and compensation (Füssel and Klein, 2006; Pielke Jr *et al.*, 2007; Preston *et al.*, 2011). As a result, "action on adaptation as a response to climate change has been limited and even discouraged throughout the 1990s when there was considerable faith in the ability of mitigation to be effective in tackling climate change" (Ford, 2008, p.7). Hence why there is only one main mandatory requirement for UK-listed businesses to do adaptation reporting (Table 4-a).

The ARP emerged because of a change in perception amongst state actors in the last decade. As climate change became increasingly accepted, a degree of change inevitably (IPCC, 2007), and stronger arguments that climate adaptation could bring immediate benefits in the form of reduced sensitivity (Ford, 2008), calls for adaptation specific policy increased. This put new pressure on the UK Government to develop a formal climate adaptation agenda to remain a leader on climate

other sources not owned or controlled by the company, such as business travel, external distribution, supply chain (e.g., extraction and production of purchased fuels and materials) or the use/disposal of the company's products and services" (WBCSD/WRI, 2004, p.26–34).

change, of which the ARP contributes. More importantly though this change in thinking and wider acceptance of climate change translated and contributed to the generation of the Climate Change Act, which is discussed next.

4.3 Climate Change Act 2008

4.3.1 History and Passage of the Climate Change Act 2008

"By 2006 a curious disjunction had emerged between the UK's leadership on the international stage […] and the inadequacy of UK domestic CCEP [climate change and energy policy]" (Carter, 2014, p.425). The Government's domestic efforts to tackle climate change were failing. Major inadequacies first identified by analysts and critics, and later acknowledged by the Government[27], argued domestic climate policy was more aspirational in nature than actionable (Jordan and Lorenzoni, 2007). With growing calls for more aggressive and concrete climate action (IPCC, 2007), this presented a major dilemma for the UK Government, which had relied on its ambitious and widely perceived successful domestic climate policies to establish and maintain a position of strength (Darkin, 2006; Carter and Ockwell, 2007).

Yet, paradoxically, this failure contributed to the politicisation of climate change in the UK that led to the Act. The timing of the failure coincided when societal interest for climate change was at an all-time high. The UK Government's continued use of domestic climate policy to demonstrate leadership internationally had helped put climate change firmly into the media spotlight. This attention renewed or in some instances instilled newfound public concern, interest and support from the business community, and strengthened the influence of the Green lobby (Carter, 2014). The combination of failing policies and high societal interest made climate change a politically salient issue that rapidly attracted political attention; especially from the Conservative Party that under new leadership (recently installed because of a dismal performance in the 2005 General Election) saw climate change as a way to 'detoxify' the Conservative brand to appeal to women, younger voters, and liberals (Rollinson, 2010; Lockwood, 2013; Carter, 2014). Consequently, despite philosophical differences, for the first time there was a tentative cross-party consensus supporting climate action. That is, a fragile consensus emerged over the nature of the problem and the governance required (Hulme, 2009; Swyngedouw, 2010). A relatively unchallenged notion emerged, that to achieve climate sustainability and to avoid disaster relied upon reducing and stabilising CO_2 emissions to an agreed acceptable level (Boykoff et al., 2010).

Although this consensus existed the three major political parties still (albeit uncharacteristically) competed over who is the greenest and most climate progressive (Jordan and Lorenzoni, 2007; Carter, 2008; 2014). Under this condition (i.e., political salience) a window of opportunity opened for 'policy entrepreneurs' (see Hill, 2012) to radically transform domestic climate policy. That is, as

[27] In 2006 the Government in a review of the UK Climate Change Programme acknowledged what many analysts had argued, that the UK's own unilateral CO_2 emission target set in 2000 was likely to be missed by quite a substantial margin (HM Government, 2006).

exemplified by the following Government official and 6 others, the combination of social pressure from below and Government's desire to show leadership played a major hand in driving the Act:

> *"I think it was a unique combination of pressure from below from the big ask campaign, and political leadership from the top saying well, we are going to do this." (Government official A, Interview 2)*

Specifically, Friends of the Earth (FoE), an environmental non-governmental organisation, launched the 'Big Ask' campaign. Capitalising on societal and political momentum FoE successfully canvassed Members of Parliament (MPs) to introduce "an Early Day Motion (EDM) in Parliament (a mechanism used by MPs to draw attention to an issue or event) calling for a bill to make the emissions reduction targets statutory" (Carter, 2014, p.426). Then crucially on September 1st 2006 FoE's Big Ask campaign received unlikely public support from the Conservative leader David Cameron (alongside existing support from the Liberal Democrats), and had persuaded 412 MPs from all parties to sign the EDM. Within weeks the New Labour Government announced its support for a Climate Change Bill, truly setting the wheels in motion (Carter, 2014). By March 13th 2007 a draft Bill was introduced to Parliament, which received support from pockets of the business community. By November 26th 2008 the Act as it stands today received Royal Assent, making the UK the first country in the world to legislate for climate change mitigation and adaptation. In fact, the UK's MPs almost voted unanimously (463 to 5) in favour of passing the Climate Change Act 2008.

The Act principally aims "to ensure that the net UK carbon account for the year 2050 is at least 80% lower than the 1990 baseline" (Climate Change Act 2008, p. 6); and ensure through a National Adaptation Programme that Government, the business community, and society are becoming 'more climate ready'[28] (Climate Change Act 2008). To achieve these ambitious aims, the Act included a series of provisions.

First, it requires the Government to set sequential legally binding 'carbon budgets' – a cap on the amount of greenhouse gases emitted in the UK over a five-year period. Second, it established the Committee on Climate Change (CCC), an independent, expert body to advise the Government on its carbon budgeting and climate policies, and report to Parliament on progress being made; as well as providing advice to and scrutinising the Government's climate adaptation initiatives though an Adaptation Sub-Committee[29]. Third, it requires the Government to regularly assess and prepare Climate Change Risk Assessment's (CCRA)—the first[30] was published in 2012—that will be used to inform the National Adaptation Programme (NAP), a strategy to be updated every five years. The

[28] By 'climate ready' the Government envisions "a society which makes timely, far-sighted and well-informed decisions to address the risks and opportunities posed by a changing climate" (Defra, 2013a, p. 4).

[29] More specifically, the Adaptation Sub-Committee was introduced to provide advice, analysis, information and other assistance in relation to requests from UK national authorities for consul on adaptation; help prepare and write the CCRA report; and implement the NAP (in England).

[30] The first CCRA is available at: https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-government-report. Date accessed February 7, 2013.

first[31] NAP published in 2013 was co-created[32] by Government (central and local), businesses, civil society and public sector organisations with the aim to address the most pressing risks identified in the CCRA, and build resilience in five key themes (e.g., business and services; health and wellbeing; built environment and infrastructure; agriculture and forestry; and natural environment). Finally, the Act provided Government with two 'reporting powers' to ask certain stakeholders to a) report on their emissions of greenhouse gases from activities for which they are responsible; and b) provide a separate narrative on how they are adapting to risks associated with climate change (Climate Change Act 2008). Both powers were applied for the first time in 2013 and 2010 respectively, where selected companies were legally obligated to respond but neither required nor mandated to take action beyond reporting.

The thesis will now introduce each of these reporting requirements (in separate sub-sections) explaining their purpose, the business companies affected, what information is collected, and enforcement mechanisms.

4.3.2 Reporting Requirement One: Mandatory Carbon Reporting

The official purpose of the Mandatory Carbon Reporting (MCR) requirement—introduced in the Act and written into Companies Act 2006 (Strategic and Directors' Reports) Regulations 2013—is threefold: to help the Government meet emission reduction targets; to enable investors' to incorporate climate risk into their decisions; and to increase the awareness and number of companies reporting on their GHG emissions with the aim to improve the identification of opportunities to reduce costs, and develop strategies with emission reduction as a core principle (Defra, 2013b).

The MCR is the latest in a long line of carbon-focused mandatory reporting requirements (Table 4-b) that have aimed to stimulate corporate action directly (because companies are only able to manage what they know) and indirectly (through increased social pressure) to better manage emissions (Kauffman *et al.*, 2012). Indeed, as summarised in Table 4-b, all companies regardless of sector characteristics (e.g., energy intensity, environmental sensitivity) have been subject to some kind of carbon-focused mandatory reporting requirement. For instance, energy intensive firms have performed carbon reporting in response to the CCL and EU ETS, while non-energy intensive firms have participated in the CRC, and now both do the MCR (Table 4-b).

[31] The first NAP is available at: https://www.gov.uk/government/publications/adapting-to-climate-change-national-adaptation-programme. Date accessed August 7, 2013.

[32] Through co-creation of the National Adaptation Programme, Defra hopes to stimulate innovative policymaking and to empower a wide variety of no-government organizations to take responsibility for finding the best solutions for their sector.

Table 4-b: Main characteristics of carbon-focused UK mandatory reporting requirements

Name	Scope[33] and boundaries	Companies affected	Assurance	Reporting platform	Enforcement mechanisms
Climate Change Levy (CCL)	Focuses on energy use and energy efficiency (in Scope 1 and 2 sources) rather than CO_2 emissions (or other GHGs)	Energy intensive industries	Not specified	Every 2 years, submitted to Environment Agency	Removal of levy discount for non-compliance
European Union Emission Trading Scheme (EU ETS)	Scope 1 emissions CO_2, N20, PFC	Energy intensive industries, particularly Energy, Extractive, Industrial firms	Data must be verified by a credited verifier	Yearly, submitted to Environment Agency Cap and trade	Penalties for various activities[34]
Carbon Reduction Commitment (CRC)	Scope 1 and 2 emissions Only CO_2- all on site fuels, process CO_2 and imported electricity/heat paid for directly	Large non-energy intensive firms and public sector organisations not covered by EU ETS or the CCAs	Not specified	Yearly, submitted to Environment Agency Cap-and-trade	Penalties for non-compliance[35]
Mandatory Carbon Reporting (MCR)	Scope 1 and 2 emissions All 6 GHGs[36]	Companies listed on the main market of the London Stock Exchange	Recommended	Yearly, to be included in Annual report Reviewed by Conduct Committee of the Financial Reporting Council	Failure to meet reporting standards may result in a revised report

Where the MCR is different to other mandatory requirements is twofold. Firstly, the MCR affects a broader range of companies. Instead of a select group of companies, usually based on sector characteristics, all companies (as defined in section 385(2) of the Companies Act 2006) that

[33] Scope refers to the sources of emissions (e.g., direct and indirect, as well as sources not owned or controlled by another company) as defined and categorised by the GHG Protocol.

[34] More information available at: https://www.gov.uk/guidance/eu-ets-monitoring-and-reporting. Date accessed December 29, 2015.

[35] More information available at: https://www.gov.uk/guidance/crc-energy-efficiency-scheme-evidence-audits-and-penalties. Date accessed December 29, 2015.

[36] Companies are required to quantify and report on emissions of the following greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). Notably these are the same six gases signatures of the Kyoto Protocol 1997 have to reduce.

are UK incorporated and whose equity share capital is listed on the Main Market of the London Stock Exchange UK or in an EEA State, or admitted to trading on the New York Stock Exchange or NASDAQ Stock Markey (Crown, 2006) are subject to the MCR. Under this criteria the MCR was applied to over 1,100 listed companies[37]. As a result, 69% of the 176 companies in the sample are mandated by the MCR (Table 4-b). Secondly, unlike other carbon-focused mandatory requirements companies are obligated to disclose carbon information in the public domain (Table 4-b). That is, whereas responding to the CRC only requires companies to submit information to the Environment Agency, the MCR requires companies to annually report their Scope 1 (direct) and Scope 2 (energy indirect) GHG emissions (as defined in the GHG Protocol) for which they are responsible in their Annual (Directors') report (Defra, 2014). This allows for speculation over the role social pressure will play in influencing corporate reporting behaviour in response to the MCR. Under the MCR society will have greater access to the way companies are reporting, which is perceived to enable them to influence companies more directly (Defra, 2014). It is therefore anticipated that social pressure will have a significant affect in the way companies respond to the requirement because of the symbiotic relationship between society and business.

In terms of how emissions are measured there is no prescribed methodology under the regulatory guidance. Companies' are instead recommended to use the 'UK Government Greenhouse Gas Reporting Guidance' or any other widely recognised independent standard (with robust and accepted methods) (e.g., GHG Protocol) to measure their emissions so long as they state which method has been used (Defra, 2013b; Delay, 2013; GRI, 2013). Companies' are also free to reuse data already collected for other formal reporting requirements (e.g., EU ETS, CRC EES) to populate their report, though, "if companies take advantage of this provision, they must make it clear in the report that they are doing so" (GRI, 2013, p.76). The guidance does require companies to express emissions by way of an intensity ratio[38] (and disclose the reporting methodology utilised). This is to allow interested parties to establish a clear understanding of the operations for which emissions data has been reported, and if and how this differs from operations within the consolidated financial statement of the company. Assurance of disclosed emissions data is not a regulatory requirement, rather, "it is recommended as good practice" (Defra, 2013b, p.32).

While all this flexibility in the regulatory guidance is presumed to reduce the regulatory burden for both the Government and reporting authorities it may cause problems for stakeholders (e.g., potential investors, shareholders, clients) trying to compare companies data generated from different methodologies. Andrew and Cortese (2011a; 2011b) argue different approaches to carbon reporting have made it difficult to fairly compare emissions data sets collected through two different methodologies. Despite similarities in methodologies it is still comparing apples to

[37] In the future the MCR could be increased to include more than 24,000 businesses (Delay, 2013; GRI, 2013).

[38] The intensity ratio expresses their emissions in relation to a quantifiable factor associated with its activities. This allows emissions to be normalised in order for the company's growth to be taken into account and facilitates comparison over time and across different sectors and products.

oranges. Therefore, it may not actually make it easier for stakeholders to assess the emissions performance of companies from the same or different sectors to inform decisions.

The requirement came into force for the first time for companies with reporting years ending on or after 30 September 2013. Notably for the first reporting year a proportion of companies would have to report emissions data that occurred before the MCR was introduced. Indeed, Carbon Clear (2013, p.9) determined "only 52 companies of the FTSE 100 would meet the requirements specified […] if they applied to 2012 reports". As a result companies were given a concession if they did not have all of the information necessary to meet the regulatory requirement because the Government was keen to ensure it would be practical and as low a burden as possible (Defra, 2013b). Therefore, companies could either a) provide estimates based on extrapolating data they do have or from using generic data not specific to their company as well as the methodology for carrying this work out; or b) explain why they are unable to provide twelve months of data. Once companies have gone through one reporting cycle they are expected to address any missing information. In addition, they are required to disclose emissions data previously reported alongside new emissions data (from the present year), so as to allow stakeholders to compare data from year to year, and to establish an overall trend.

Enforcement of the requirement (i.e., monitoring of compliance) is the responsibility of the Conduct Committee of the Financial Reporting Council, "the UK's independent regulator responsible for promoting high quality corporate governance and reporting to foster investment" that sets, monitors and enforces standards for corporate reporting and auditing (Financial Reporting Council, 2014). The Committee has the power to make enquires where disclosure appears to fall below the requirement, and if necessary, to require reporting authorities to prepare a revised Directors' report. However, there are no financial penalties for non-compliance or reporting inadequately (Defra, 2013b). What's more companies only have to report emissions data. They are not required to undertake any additional action or make attempts to reduce their emissions or energy consumption to lower carbon taxes. Simply put the MCR is solely a requirement on companies to report.

4.3.3 Reporting Requirement Two: Adaptation Reporting Power

The 'Adaptation Reporting Power' (ARP) requirement is the only legislative lever available to the Government to influence corporate behaviour on climate adaptation. After discussions with various experts and the consideration of consultation responses by sixty-six organisations[39], the then Environment Secretary Hillary Benn on 26th November 2009 laid before Parliament the Government's[40] first strategy for exercising the ARP. Written prior to the publication of the Climate Change Risk Assessment, which was anticipated "to be a substantial piece of evidence for building the reporting power around" (Defra, 2009, p. 15), the strategy's aims were simple.

[39] The consultation was carried out between 18th June and 9th September 2009.
[40] The Labour Party was the majority political party at the time.

Alongside informing the general objectives listed in the Act[41], it aimed to ensure that reporting authorities – defined in the Act as any persons or bodies with functions of a public nature and/or statutory undertakers[42] – not only became more climate resilient, but were also able to make more cost-effective and timely decisions about how and when to adapt; while additionally aiming to make them more aware of how their plans effect stakeholders they interact with (Defra, 2009).

To achieve these aims the Government exercised the right to direct (e.g., mandate) organisations to report. In particular, it targeted companies that were largely responsible for the maintenance of, investment in and/or regulation of critical infrastructure that is strategically important in the delivery of public services (Defra, 2009). The criteria also aimed "to be proportionate in minimising additional reporting burdens on the public and private sector bodies and to avoid identifying authorities who already had requirements in regulation to report on climate change adaptation" (Defra, 2012, p. 4). For instance, at the time Local Authorities (not the UK business community) were responding to the Local Government performance indicator on adaptation, 'N188' (Porter *et al.*, 2015). As such, they were excluded from being directed to report.

In theory the application of these criteria identified over 100,000 organisations eligible to report. To help reduce this figure to a more manageable number the Government adopted "the Better Regulation Executive's principles of 'Think Small First' to ensure that no Small or Medium Sized businesses are considered as priority reporting authorities in this round of reporting" (Defra, 2009, p.19). This helped prune the list down to 91 companies representing Energy utility, Transport, Water, Natural environment, Health, and Regional Authorities, as well as their respected regulatory bodies being directed to report. In addition, the Government invited a set of companies—representing Food, Electronic communications, National Park Authorities, and Petroleum sectors—that did not sit within the legal definition of a reporting authority, but whose adaptation was considered crucial to the on-going functioning of daily life in the UK; or had expressed willingness to be involved in the process and to be seen as exemplars in adaptation (Defra, 2009). However, only twelve organisations, all National Park Authorities, accepted the invitation. Companies from the Food, Electronic communications, and Petroleum sectors declined.

The ARP is not an annual reporting requirement like the MCR. Instead it runs through a five-year cycle[43]. Significantly this setup allows its applications to be changed from cycle to cycle. Specifically, provided the Secretary of State explains their approach to exercising the ARP, it can be applied to a set of new reporting authorities, and be implemented using a different mode of

[41] The ARP aims to ensure climate change risk management is systematically undertaken by reporting authorities; to help ensure public service and infrastructure are resilient to climate change; and to monitor the level of preparedness of key sectors to climate change.

[42] The definition of statutory undertaker is taken from the Town and Country Planning Act (1990), the Town and Country Planning (Scotland) Act (1997) and the Planning (Northern Ireland) Order (1991).

[43] On July 1st 2013 Defra published its second strategy for exercising the Power. Significantly, alongside identifying a new set of reporting authorities, the second strategy ushered in a new style of regulation for the ARP; a switch in the mode of governance from state directed to invitation based – with reporting now voluntary.

governance. Indeed, on July 1st 2013 Defra published its second strategy for exercising the ARP. Alongside identifying a new set of reporting authorities, the second strategy ushered in a new style of regulation for the ARP; a switch in the mode of governance from state directed to invitation based. That is, participation in the second round is voluntary instead of mandatory. While this flexibility allows the Government to ensure the ARP is utilised to its maximum potential according to the conditions at the time, it may have long-term repercussions on its ability to affect business performance. Changes in regulation imply a lack of certainty, which has been shown to holdback corporate responses as companies adopt a wait-and-see approach until the requirement becomes established (Eberlein and Matten, 2009; Boiral *et al.*, 2011).

In regard to the reporting process companies are required to generate a specific (standalone) adaptation plan that includes an assessment of their current and predicted climate risks and opportunities, and a programme of measures (with time-scales for implementation) to address the risks highlighted, as well as information on any policies or practices that are already being implemented (Defra, 2009). In addition, companies are required to explain the methodology used to assess their climate risks and opportunities, and make representations[44] for any information reported which they consider should not be published (Defra, 2010).

Defra's strategy for exercising the ARP that accompanied the direction to report did not formally have a standard template for reporting. Instead it included a set of strongly implied guidelines on how to fulfil the statutory requirement. Of note, Defra discussed what corporate information should and should not be included (e.g., topics of discussion such as interdependencies, timescales, uncertainty), and recommended sources of climate information to enable evidence-based decision-making (Defra, 2009). In particular, the guidance recommends companies use the UK Climate Projections 2009 (UKCP09) to help them report.

UKCP09, the latest and fifth generation of UK climate projections, aims to enable users to determine what economically, socially and environmentally sensible investments they can make for low, medium and high risk weather events and climate change (Hulme and Dessai, 2008a; 2008b; Jenkins *et al.*, 2009; UKCIP, 2011). These projections were "purposefully designed to meet the needs of a wide range of people who will want to assess potential impacts of the projected future climate and explore adaptation options to address those impacts" (UK Climate Projections, 2011). To achieve this, UKCP09 provides users with a wealth of climate information, including: a briefing report; climate change land projections (e.g., variables of temperature and precipitation); marine and coastal projections (e.g., variables of storm surge and sea level changes); observed trends in climate data; a weather generator; and an 11-member regional climate model output ensemble; and spatially

[44] Representations must demonstrate that this information is information that the Secretary of State is not obliged to publish on the basis that it meets one of the exemptions in section 63 (7) of the Climate Change Act 2008, namely: a) that it is information which the Secretary of State could refuse to disclose in response to a request under the Freedom of Information Act 2000, or the Environmental Information Regulations 2004 (SI 2004/3391) or any regulations replacing those regulations; or b) that it is information whose disclosure is prohibited by any enactment (Defra, 2010).

coherent projections (Jenkins et al., 2009; Street et al., 2009; UKCIP 2011). In addition, compared to previous projections, UKPC09 information offers users much greater detail and complexity (e.g., climate projections quantify uncertainty explicitly in a probabilistic fashion, and the 25km (instead of 50km) grid squares provide greater spatial resolution), and functionality (e.g., possible to assign probabilities to different future climate outcomes, reflect on uncertainties, and visual and interrogate data to produce maps and graphs) (Tang and Dessai, 2012). However, despite these improvements, the usability of UKCP09 is affected by various uncertainties—modelling uncertainty, natural climate variability, and emissions uncertainty (Jenkins et al., 2009)—in the science, and the use of Bayesian probabilistic projections (Tang and Dessai, 2012); which are not necessarily the type decision makers are familiar with or want (Dessai and Hulme 2004; Stainforth *et al.*, 2007) or actually encourage a more robust decision-making approach (Smith *et al.*, 2009; Arnell, 2011; Reeder and Ranger, 2011). This allows for speculation about the extent UKCP09 informs both the adaptation reporting process and decisions to adapt. It is anticipated that companies more capable of using UKCP09 will utilise it more prominently in reporting and decision-making.

Enforcement of the requirement is the responsibility of Defra who examine the reports to identify any barriers to action and interdependencies between risks that can inform the CCRA. Notably, the adaptation reports are also independently reviewed by a) a team at the Risk Centre at Cranfield University who analysed the risk assessment methodology and results; and b) policy leads in relevant departments (e.g., Department of Transport) and devolved administrations who evaluated the report from a policy perspective (i.e., lessons to inform future work) (Defra, 2012). However, despite all these review steps, there are no financial penalties for non-compliance or reporting inadequately, nor are companies required to do anything beyond submitting their report to Defra (Defra, 2009). Participants do not need to make any of the information publicly available.

4.4 The UK's Changing Mode of Governance

Despite inherent differences in purpose and scope the mode of governance employed for the MCR and ARP are similar, if not the same. Rather than apply a traditional mode of governance (e.g., command and control), both reporting requirements mandated participation, but did not prescribe action beyond reporting, and were flexible about participants reporting methodology. Moreover, neither applies financial penalties for non-compliance or reporting inadequately; instead companies may be subject to re-reporting (Defra, 2009; 2013b).

This mode of governance is in stark contrast to previous mandatory requirements such as the CRC (Table 4-b), whereby companies must measure and report on their energy consumption and buy allowances for the amount of CO_2 emissions associated with that in order to avoid significant financial penalty for failing to comply. In fact, as the following individual from a regulatory agency reflected, the mode of governance used by both reporting requirements represents a shift in the Government's strategy for governing climate change:

> *"The Government is trying to transfer more responsibility to change on companies rather than stipulating what criteria companies need to meet in order to comply with their regulatory obligations." (Regulator agency B, Interview 1)*

By and large command and control regulation has dominated Government and regulator approaches to governing environmental issues (Sinclair, 1997). Indeed, most of the main mandatory requirements listed in Table 4-a have been implemented using this traditional mode of governance. Whereby, Government (or regulators) 'command' companies to disclose specific information at fixed standards of reporting under the force of law and threat of sanctions (e.g., financial penalties) for failure to comply (Sinclair, 1997; Potoski and Prakash, 2005; Prakash and Potoski, 2012). For example, under the EU ETS companies face financial and other penalties in cases of non-compliance (Kauffman *et al.*, 2012).

While this mode of governance presents the Government as acting swiftly and decisively on sensitive policy issues like climate change, it is widely criticised. In particular, criticism exists about its enforcement cost; inefficiency; rigidity; tendency to stifle innovation; limited industry input; and biased focus on 'end of pipe' solutions rather than prevention in the first place (Sunstein, 1990; Hahn and Stavins, 1991; Bebbington *et al.*, 2007; Prakash and Potoski, 2012). Moreover, the business community's stance on climate change has transformed to a more sympathetic collaborative position. As a result, command and control approaches to regulation are not necessary required to get companies engaging with an issue. These two factors combined with the Government's ideological push towards deregulation and smaller government have spurred the application of alternate modes of governance, including but not limited to economic incentives, co-regulation, and self-regulation to improve the relationship between the regulator and regulatee (Bebbington *et al.*, 2007). Indeed, self-regulation's "promise of industry co-operation and 'win-win' outcomes […] is widely touted as a means of avoiding the pitfalls of direct regulation and of doing so at considerably less cost to Government" (Sinclair, 1997, p.530).

In lieu of an explicit sanction the MCR and ARP relied on an approach that utilised principles and techniques of 'nudge theory' to encourage companies to not only comply but also act beyond reporting. Both requirements publicly named companies required to report and ensured submitted information is freely available in the public domain so that society can 'name and shame' non-compliers, cases of poor reporting practice, and apply pressure to act. Theoretically exposing participants to greater social and market pressures will nudge them and others to behavioural changes. Arguably, this can be seen as a form of self-regulation because it relies on the goodwill and cooperation of companies for their compliance, and uses peer and public pressure as means to achieve this end (Sinclair, 1997). Also to some degree, both reporting requirements experienced a degree of 'co-regulation'—back and forth exchanges with each participant adjusting their response based on the response of the other (Belford, 2012)—because of the consultation phases ran to encourage industry input. Industry had scope to shape regulatory outcomes, with Government still retaining general design oversight (Sinclair, 1997). Despite the benefits of self-regulation (and co-

regulation), it has been cited as the reason for many major financial and environmental failures. Short (2013) offers the Leeham Brothers collapse and BP's Deepwater Horizon oil spill as examples of failed self-regulation.

Echoing characteristics of governmentality, 'nudge theory'—coined by Richard Thaler and Cass Sunstein and based on the psychological models and philosophical concepts of Daniel Kahneman and Amos Tversky—assumes the behaviour of people can be influenced by changing the way choices are presented to them (Thaler and Sunstein, 2003; 2008). The application of certain cues (e.g., reporting), combined with individual's desires and values, will overcome decisions and arguments to not change behaviour. Reporting is used as mechanism to nudge companies towards a self-realisation that outright changes or modifications to existing practice and behaviour will yield positive outcomes and make them better off (Sunstein and Thaler, 2003; Thaler and Sunstein, 2008; Jones *et al.*, 2011; Whitehead *et al.*, 2012). This light approach to mandatory reporting ultimately aims to get companies to review and police themselves, which, over time, becomes sustained by self-constituted rules and norms (Thaler and Sunstein, 2003; Shore, 2008).

To that end, this applied mode of governance for the MCR and ARP should not be taen to imply an absence of governmental control (or the absence of politics). Quite the opposite, nudging is a new means of control at a distance. "As Power (1995; 1997a; 1997b; 2000) showed so clearly, the technologies of budgets, audits, standards, and benchmarks, apparently so mundane, were crucial for the operationalisation of programs of governing at a distance that characterised the forms of new public management taking shape under rationalities of advanced liberalism" (Rose *et al.*, 2006).

Underpinning nudge is the (oxymoronic) concept of libertarian paternalism; "an approach that preserves freedom of choice but that authorises both private and public institutions to steer people in directions that will promote their welfare" (Sunstein and Thaler, 2003, p.1201). That is to say, while it is legitimate for the 'choice architect' (i.e., stakeholder responsible for organising the context in which people make decisions) to attempt to influence or steer behaviour to improve the quality of people's lives (the paternalism aspect), this should not come at the expense of their freedom of choice to opt out (or in) of undesirable arrangements and seek alternate options (the libertarian aspect) (Thaler and Sunstein, 2008). "Libertarian paternalists want to make it easy for people to go their own way; they do not want to burden those who want to exercise their freedom" (Thaler and Sunstein, 2008, p.5). By not including specific guidelines on reporting methodology both reporting requirements provide companies with the freedom to seek alternate approaches that better fit their practice. The hope might be that it empowers companies to not only participate but also take action.

However, questions exist over whether nudge-based regulation can bring about fair change universally, and if nudge is in fact a subtle form of manipulation (John *et al.*, 2009; Bonell *et al.*, 2011; Marteau *et al.*, 2011; Goodwin, 2012; Vallgårda, 2012). For instance, nudging appears to capitalise on instances of poor decision-making, which could be perceived as taking advantage of the situation. What's more, it is argued, "nudging alone is not an effective strategy for changing

behaviour on the kind of scale needed to solve society's ills" (Goodwin, 2012, p.86). Nudges maybe too small to affect worthwhile change. John *et al.*, (2009) claim small improvements in energy efficiency are insufficient on their own to tackle climate change because it requires society to recognise and make major lifestyle changes. Similarly, in the context of people's health and mental wellbeing, Marteau *et al.*, (2011) contend while the idea of nudging people towards a healthier lifestyle is possible, in commerce shaped environments there is the high potential of being nudged back as companies react to customer changes.

Perhaps more importantly the one problem with the application of nudge theory in this context is that it presumes that organisations are like people. A single actor that acts in its perceived best interests, rather than a fragmented entity whose left hand in Human Resources doesn't know what the right hand in Estates is up to. Different operational functions are likely to react to these mandatory requirements differently. The same can be said for companies from different sectors. Even though they are subject to the same mandatory requirement they have different operational characteristics, and may experience different social pressures that will affect their decision-making distinctively. Therefore, questions also exist about what extent these nudge-based mandatory requirements can shape the behaviour of different functions and companies from different sectors in the same way.

Significantly these questions cast doubt on the effectiveness of nudge-based regulation in stimulating corporate responses to climate change. A question can be asked about what extent it is fit for purpose to address the absences in the business community's engagement with climate mitigation and adaptation. It is distinctly possible that nudging may not affect business performance at all, with corporations continuing to execute the same climate responses. Moreover, it may affect certain sectors more than others because of differences in operational characteristics. Equally though, it is possible nudging maybe more effective for one genre of reporting than another. Carbon reporting and adaptation reporting have very different perceptions and levels of understanding in social and political spheres. This has been reflected by the plethora of carbon-based regulation introduced in the UK since climate change became a salient policy issue. By contrast climate adaptation is not yet socially or politically salient. Therefore, it is possible to anticipate a difference will exist between the role of the MCR and ARP in affecting organisational cultures and behaviours. Arguably the ARP will have a greater impact because companies are less familiar with adaptation reporting; more information identified by responding to the ARP will be new to companies since they have not performed such formalised adaptation reporting before.

4.5 Summary

The chapter began by introducing the UK's approach to climate policy – the adoption of aggressive climate policies to support its leadership agenda. To support these policies the Government has introduced a number of mandatory reporting requirements that UK-listed companies have had to respond to. Notably, most of these Government-led requirements (Table 4-a) are biased towards

mitigating GHG emissions. Mandatory requirements have largely focused on pricing GHG emissions, stimulating development and deployment of clean or renewable energy, and improving energy and water efficiency (Bowen and Rydge, 2011). Only the ARP requires business companies to engage in climate adaptation. As Bowen and Rydge (2011, p.16) note, "policies to promote efficient adaptation to the uncertain impacts of climate change are underdeveloped".

Therefore it is anticipated that such a bias will influence patterns of climate reporting in the business community. Reporting is said to not only improve awareness but also enrich the information base upon which decisions are made (Füssel and Klein, 2006). Given the greater exposure to carbon-focused regulation it is possible to hypothesise that more companies will be performing carbon reporting than adaptation reporting because they are more familiar with that genre of reporting. This may in turn influence the extent and degree to which the MCR and ARP affect business performance. Lessons learned are anticipated to influence a company's perception towards participating in the new reporting requirements. That is to say experience of reporting will affect the extent to which a company considers reporting to be of intrinsic value to business performance. With companies' more familiar with carbon reporting it is possible they will perceive the impact of the MCR to be less than the ARP because many of the benefits and risks of carbon reporting should be understood. The new nature of adaptation reporting under the ARP should highlight more unknowns, which makes its perceived impact to be greater.

The MCR and ARP apply similar modes of governance to mandate reporting. Neither carry financial penalties for non-compliance or reporting inadequately, nor are companies required to do anything beyond reporting (Defra, 2009; 2013b). However, there is a difference in reporting platform. Where the MCR has a public element to reporting, whereby data has to be disclosed in the Annual report, there is no public element to the ARP; companies only have to submit data to Defra. This difference is anticipated to affect the role social pressure plays in both reporting requirements. In particular, there may be more social pressure attached to the MCR than the ARP because they have to disclose information in the public domain, which means more and a wider audience of stakeholders are likely to see the report.

However, given both the MCR and ARP do not carry a mandate for companies to take action and implement their report findings it is an open question as to whether firms will do anything beyond reporting. Rather than apply command and control regulation (like other requirements) both utilise the principles of nudge. Effectively once a company has reported, and therefore complied with the requirement, what they do next is their own responsibility. That is, they are not assessed and governed further than the reporting process. Thus although organisations are likely to be reporting it is unclear as to whether they will be implementing their plans or not. It is hypothesised that this mode of governance will affect corporate responses to the two reporting requirements differently because of experience. The ARP is the first of its kind requiring companies to report on adaptation, whereas the MCR is the latest in a line of carbon-focused reporting requirements. It is therefore interesting to understand how a framework on adaptation may help or alter the way a company operates in comparison to carbon-focused regulation.

Finally, there is likely to be some sector variation in the extents of carbon reporting and adaptation reporting. Traditional mandatory requirements resided with energy intensive firms, e.g., CCL and EU ETS. Overtime policy and regulation spread to non-energy intensive firms, e.g., CRC. Thus all sectors in some way are affected by carbon-based mandatory requirements. The same cannot be said for adaptation, where only critical infrastructure providers are mandated to report. With a smaller scope of companies subject to an adaptation-based mandatory requirement, it is possible that there will be more rationales for adaptation reporting than carbon reporting, where many companies are expected to indicate that reporting occurs because they have to. Therefore, there are likely to be differences between sectors with different operational characteristics.

Chapter 5 Corporate Climate Reporting: Patterns and Discourses

5.1 Introduction

Having discussed the origins of climate reporting in the UK in the last chapter, this chapter explores what 176 leading UK-registered companies are doing. It draws upon the desktop review—undertaken between June 1, 2013 to September 30, 2014—of publicly available climate information in the most recently available Annual reports, CSR reports and websites of 176 companies, as well as 36 interviews with representatives from a smaller sample of those firms (see Chapter 3 for further details on data and methods).

The chapter is split into two sections. Section one examines the broad volumes of reporting and how they vary by genre and sector. In particular, it discusses what climate information is publicly disclosed by companies in terms of the quantity of information, and the type of information (e.g., climate mitigation and climate adaptation). Section two explores how corporate reporting frames climate change. It discusses the dominant discourses of reporting by introducing and providing examples of the frames employed to discuss climate information. It is important to understand how climate change information is constructed and framed because of what it suggests about organisational cultures of reporting and associated responses to climate change. The chapter finishes by summarising the main points.

5.2 General Patterns of Climate Reporting

5.2.1 Levels of disclosure

With the exception of the new MCR data, most of the climate information made publicly available in Annual reports, websites, and other corporate documents (e.g., CSR report, and climate change statements and standalone reports) is disclosed voluntarily at the discretion of the company. For example, companies responding to the ARP[45] are not required to disclose their report nor any of its contents on their website or Annual and CSR reports. Likewise participants of CDP's Climate Change Program[46] do not need to publicly disclose submitted material on their own website to participate or receive a higher disclosure score. Therefore, what and how climate information is disclosed publicly through corporate mediums is typically the company's decision.

[45] Defra, on their own website (https://www.gov.uk/government/publications/adaptation-reporting-power-received-reports), published the adaptation plans of companies that participated in the first round of reporting.

[46] CDP's Climate Change Program collects and shares information on the risks and opportunities of climate change from companies to increase transparency around climate-related investment risk and commercial opportunity, and drive investments towards a low carbon economy.

With this in mind it is unsurprising to find considerable variation in the type, volume, detail, and assiduousness with which companies publicly report on climate change. Indeed, reporting ranges from companies that meticulously detail their GHG emissions in accordance with a voluntary standard like the GHG Protocol or assess their drought plan in a whole dedicated section of their website; to companies devoting just a sentence in their Annual report that states they calculate their carbon footprint or acknowledges climate change as a business risk. One way to begin making sense of this variety is by categorising the 176 companies sampled into one of four levels of disclosure (listed in Table 5-a), whereby different levels are defined by the volume, detail, and assiduousness of the climate information they report.

Table 5-a: Degrees of climate change reporting on corporate websites and documents

Level of disclosure		**Reports characterised by…**	**Number of companies**
0	'Non-disclosure'	No reference to climate change on corporate website or in corporate documents (e.g., Annual report).	13
1	'Limited data or text'	Minimal quantitative data and/or passing qualitative references to climate change that are typically a sentence or paragraph in length.	23
2	'Basic data and text'	Basic table of quantitative data supported by some specific qualitative explanation and justification.	67
3	'Detailed data and text'	Rich comprehensive tables of quantitative data supported by descriptive and specific qualitative explanation and justification; infographics; and (in many instances) multiple case study examples.	73

As well as defining the characteristics for each level of disclosure, Table 5-a indicates most companies are doing at least some basic level of climate reporting. In fact the vast majority of 176 companies (93%) regard climate change as meriting at least a mention on their website, Annual or CSR reports, with most providing at least basic data and text (level 2) and a plurality (41%) doing more. This suggests climate change, like sustainability and sustainable development, is "part of common business language" (Ihlen and Roper, 2014, p.48). The ubiquity of climate reporting is a change from the 'wait-and-see attitude' of the corporate world during the 1990s (van der Woerd *et al.*, 2003) when corporate climate reporting was a narrow practice (Kolk and Hoffmann, 2007) and the very notion of climate change was contested (Kolk and Pinkse, 2007). The figures in Table 5-a not only reiterate that corporate attention to climate change has increased (Kolk and Pinkse, 2007; Ihlen, 2009) but also support claims that momentum for climate reporting has resulted in it becoming an accepted part of the business reporting landscape (Okereke, 2007; Knox-Hayes and Levy, 2011; Sullivan and Gouldson, 2012).

The chapter will now discuss some general characteristics of each level of disclosure identified.

5.2.1.1 Level 0 'Non-disclosure'

Level 0 'non-disclosure' (Table 5-a) consists of 13 of 176 companies (7%) that make no reference to climate change despite having obligations to report to the MCR and/or ARP[47]. Half the companies in this level do not even disclose more general social or environmental information. This may imply that the refusal to engage with climate reporting reflects a more general determination by the company to keep its corporate reports narrowly focused on traditional financial performance and corporate governance issues, rather than following the trend towards wider corporate social responsibility (and environmental) reporting (Gray *et al.*, 1997; Wheeler and Elkington, 2001; Jose and Lee, 2007). If traditionalism explains the refusal of some companies to expand the scope of their corporate reporting to climate issues, that then raises the interesting question of why the other half of level 0 companies are disclosing social and environmental information but say nothing about climate change. This finding is particularly remarkable when you consider it would be relatively straightforward, un-burdensome and likely even beneficial for companies that have already gone to the trouble of discussing non-financial issues publicly and have climate data readily available, to include climate information in these narratives. Such a decision is even more peculiar in light of growing interest from institutional investors for information explaining how businesses' are managing risks and opportunities presented by climate change (Pfefier and Sullivan, 2008; Andrew and Cortese, 2011a; 2011b; Sullivan and Gouldson, 2012; Biagini and Miller, 2013; CDP, 2015).

Unfortunately none of these companies accepted an invitation to participate in the study, and there is no publicly available information from the desktop review to explain this curiosity. Therefore, in an attempt to better understand this dynamic, interview participants representing companies that do disclose publicly were asked if their company withheld any climate information from the public domain, and if yes, asked to explain what and why. Interview responses point to a number of management considerations that influence corporate decisions in other forms of non-financial corporate reporting.

First, some companies will always execute the minimum of what is required if the Government's stance and penalties for non-compliance is weak – especially with social and environmental issues (Biagini and Miller, 2013; Stubbs *et al.*, 2013). The executives of many companies see no value in going beyond the legal requirements until the Government pushes them. Indeed, interviewees (representing companies that do disclose publicly) implicitly expressed what Bansal and Roth (2000), Gunningham *et al.*, (2003), and Cherrier *et al.*, (2012) touch upon:

[47] It is important to recognise a caveat in the data. Although the MCR requires company's to disclose data in their Annual Report, the obligation only took effect from October 2013 onwards (for more details see Chapter 4). Significantly, when companies were analysed, the 5 MCR companies of this level (the other 9 are ARP, which does not require company's to publicly disclose their submission in their Annual report) had not published their latest Annual Report for the financial year post October 2013. Given the apparent willingness of companies to comply with regulations (Pfeifer and Sullivan 2008; Sullivan and Pfeifer 2009; Sullivan and Gouldson, 2012), it is anticipated, when available, the Annual reports of these 5 companies will include the necessary data. As a result, it is not possible to speculate about whether these 5 companies have intentionally ignored a formal reporting requirement.

management attitudes play an important role in how companies identify and manage social and environmental issues. That is to say, some executives do not perceive reporting on climate change as a key performance indicator for business performance.

Second, it is also possible companies are reporting on climate change internally but not disclosing this information publicly. Internal climate reporting is cited as a common business practice (Burritt *et al.*, 2011; Ascui and Lovell, 2012) because certain aspects of climate data are considered commercially sensitive for their competiveness (Agrawala, 2011; Baglee *et al.*, 2012). Indeed, companies in other levels of disclosure justify the omission of climate data from their ARP submission by citing confidentiality, for example:

> *"We have omitted 'Appendix D – Impacts of climate change on the River Dee system' as it contains information that is classified as 'Protected' under the Government Protective Marking Scheme and therefore can't be made publically available" (Dee Valley Water plc, 2014)*

Likewise, interviews with individuals responsible for climate reporting indicated that confidentiality and relevancy of information are important factors influencing whether and how data is made publicly available:

> *"…some of the information reported internally that is used for performance assessments is commercially sensitive. We would not want that to be in the open all the time. There is no incentive to do so either. Our stakeholders would not understand it or care. So externally what we try and do is summarise our performance in an understandable way that can be communicated to stakeholders to show them that we know what we are doing" (Water D, Interview 2)*

Importantly the above interview response also highlights the company carefully prepares and plans what climate information is made publicly available, suggesting that there are likely to be substantial differences in the level of granularity between what is reported externally and internally. Given this admission it is possible to argue that despite the structured metrics of mandatory requirements and voluntary indexes, information submitted is proportional and tailored for its intended audience. Companies are communicating the story they want to tell.

Third, critics of social and environmental reporting argue companies will never voluntarily disclose information that might be used to hold them accountable (Peloza, 2005; Hess, 2007; Lyon and Maxwell, 2011). In the same way companies may perceive disclosure of climate data as having a greater detrimental effect than the reputational or other consequences of non-disclosure. For instance, a company may experience a hostile reception if it discloses that its GHG emissions for 2014/5 are higher than its previous year. Thus some companies disclose information when the benefits exceed the direct and indirect costs of doing so (Meek *et al.*, 1995). In this sense, non-disclosure is a way to protect corporate reputation from growing social pressures. With the Internet making corporate information disclosure more common and widespread, it is cheaper and easier for interested parties to analyse and critique. This in turn has made interested parties become highly influential 'information entrepreneurs' increasingly capable of holding companies to account for their 'social license'. "Society somehow has the power to set conditions, monitor behaviour, impose sanctions, and ultimately to withdraw that licence" (Gouldson and Bebbington, 2007, p.10).

Finally, companies may not know how to interpret climate data they have been required to report into tangible business benefits. Indeed, quantifying adaptation-related data in a positive form is more difficult than interpreting carbon emissions data (Füssel and Klein, 2006). For instance, reducing emissions through energy efficiency improvements can immediately reduce costs and contribute to profitability. Whereas improving climate resilience only generates returns if and when extreme events occur, and even then only in the form of costs avoided rather than additional revenues or profits (Biagini and Miller, 2013).

5.2.1.2 Level 1 'Limited data or text'

Level 1 'limited data or text' consists of 23 of 176 companies (Table 5-a). Although some climate information is provided, detail is limited and any accompanying discussion lacks depth. Companies in this category tend to frame discussions of climate change in general terms rather than focusing on scientific data. For example, Fresnillo plc on their website state climate change will impact the business physically and economically, but provide no specific examples of the effects:

> *"Climate change is both an environmental and a business challenge. Expected changes in physical parameters (higher temperatures and lower annual rainfall) may result in adverse impacts to our operations and the communities where we operate such. There are also business implications of actual and potential economic regulations in a carbon constrained economy." (Fresnillo plc, 2014)*

In this instance climate change is presented as one of many business issues. Climate reporting appears to be something they do and not a strategic practice.

Moreover, the type of climate information disclosed is restricted to carbon accounting. No level 1 companies, not even those required to report to the ARP, discuss adaptation publicly. Companies either disclose simple statistics of yearly total GHG emissions; declare that they are committed to reducing their carbon footprint (or contribution); or provide assurances of their energy and/or water efficiency. Such disclosures are typically restricted to a sentence or two found in a broader topic heading such as "Sustainability", "Corporate Responsibility", or "Protecting the Environment". For example, the following statement comes from the "Sustainable Development" section of a Eurotunnel Group's website:

> *"Carbon footprint: Reduction of greenhouse gas emissions by 45% in 2008. […] Eurotunnel's commitments to reducing its carbon footprint will benefit all its customers by allowing them to minimise their impact on climate change." (Eurotunnel Group, 2014)*

While statements of this kind suggest the Transport company is aware and engaged with climate change, the very generalised nature of the reporting suggests that it is not seen as a priority or key performance indicator. If firms did regard climate change as strategically important they would be expected to disclose more information about it and make stronger links to their operating principles for managing it.

5.2.1.3 Level 2 'Basic data or text'

Level 2 'basic data and text' consists of 68 of 176 companies (Table 5-a) that not only reflect on their contribution and management of climate risks and opportunities, but also present basic sets of climate data in tables or figures. As with level 1 reporting, companies in level 2 disclosed climate information as part of Annual and CSR reports and in similarly named sections of their websites. For example, ARM Holdings plc analysed and compared 2013 GHG emissions data listed in a table with their overall emissions performance in the 'Environmental reporting' section of their Corporate Responsibility report:

> *"We also targeted a 30% reduction in carbon emissions per employee by 2020 against 2009 levels. At the end of 2013 we had achieved a reduction of 18%." (ARM Holdings plc, 2013, p.22)*

Significantly as the extract demonstrates, the presentation of climate information by level 2 companies' is neither complicated nor overly specific. Disclosures are relatively straightforward (and kept short), making it easy for stakeholders (e.g., investors, shareholders, clients, Government, regulator, and environmentalists) to understand the key messages the company is trying to communicate. While this is good practice, the predominantly positive framing of information and limitations in granularity suggest climate reporting, like more general social and environmental reporting, has become performative as companies try to stage manage disclosures to shape public perceptions of their business in the most positive possible light (Hess, 2007; Kolk and Pinkse, 2007; Ihlen, 2009; Ihlen and Roper, 2014).

Level 2 company disclosures, like those in level 1, are predominately about GHG emissions. Only 6 of the 68 level 2 companies reference climate change adaptation in broad sweeping statements, for example:

> *"[…] our environmental strategy has many strands, including; business carbon footprint, contaminated land management and adaptation to climate change." (Wales and West Utilities Limited, 2014)*

As the extract exemplifies, cited companies' do not express what, how or why they are planning adaptation. The way in which adaptation is discussed not only implies it is an afterthought to more pressing matters, but also suggests that unlike monitoring GHG emissions, adaptation is not being framed as a performance indicator either. This raises the interesting question of why companies even mention adaptation in the first place. The manner in which adaptation is discussed suggests it serves more as a reference and symbol of wider corporate engagement and compliance than because it is seen as strategically or operationally important. Adaptation disclosures are arguably designed to protect the company's legitimacy rather than paint a complete picture of the company's performance (Hess, 2007). At the same time, the disproportionate focus on carbon-related information implies companies (regardless of disclosure level) do not perceive adaptation to be as important as mitigation in their response to climate change.

The same can be asked about accounts of voluntary reporting. A third of level 2 companies note that they submit data to voluntary reporting indexes such as CDP's 'Climate Change Program', but do not provide specific details about their submission or explain the reasons for participation. Previous studies have considered such business practice to mirror characteristics of greenwashing (Lyon and Maxwell, 2011). Nevertheless, by at least mentioning the practice the company is in some way holding itself accountable, which will help create legitimacy in some interested stakeholder circles (Hess, 2007).

5.2.1.4 Level 3 'Detailed data or text'

Level 3 'detailed data and text' consists of 73 of 176 companies (Table 5-a). Disclosures by these companies are comprehensive and detailed but easy to follow because of the terminology, structure, tables, and infographics used to visualise data. Climate information is typically presented in dedicated climate change sections and/or policy documents. Most (90%) of the companies in level 3 provide standalone climate change documents or sections on their website termed "Tackling Climate Change", "Our Climate Change Strategy", "Climate Change Position Statement", "Our Carbon Footprint", "Establishing Efficiency", "Greenhouse Gas Emissions", and "Adapting to Climate Change", among others. For example, both the website and documents of WPP (2014) include climate change sections which present several years' worth of key performance data on their carbon footprint[48] and carbon intensity metrics[49] (in tonnes of CO_2e), whilst also explaining their approach for reducing these. In addition, level 3 companies provide multiple case study examples of activities integrated across the business that have been influenced by climate change, for example:

> *"We have installed solar photovoltaic panels at our plants in Edmonton, Sidcup and Wakefield, and, in 2013, we installed a solar-panelled car port - linked to electric car-charging points - at CCE's new head office in Uxbridge." (Coca-Cola, 2014)*

Such concrete detail is complemented by substantial disclosures of data submitted to both mandatory requirements and voluntary indexes. For instance, British Land (2014) make available CDP submissions as well as data submitted to the MCR, and CRC. The prominence of climate change in business reporting implies that it is regarded as a key indicator of business performance for which the firm must account. This would suggest systems of data collection and reporting avenues are fully integrated with and help to drive business operations and strategy.

Another characteristic of level 3 companies is their attention to climate change adaptation. Nearly two-thirds (46 of 75) of level 3 companies refer to climate change adaptation, with 31 also providing specific details of their concerns and actions that will address them, for example:

[48] Carbon footprint data include: Scope 1, 2 and 3 emissions; Total gross (excluding carbon reduction of renewable electricity); Carbon reduction of purchased renewable electricity; Total net (including carbon reduction of renewable electricity); and Percentage change from 2006 (net).
[49] Carbon intensity metrics include: Tonnes per employee (net); Percentage change from 2006; Tonnes per £m of revenue (net); and Percentage change from 2006.

> *"Climate change adaptation in our wastewater business is currently centred on the sustainability of the public sewerage system and the part it plays in the overall drainage system. Many existing drainage systems currently experience problems of flooding and pollution of the environment, which will be exacerbated by climate change. In our SDS, we set out the challenges relating to drainage in the North West over the next 25 years. In the past, UUW has responded to flooding by designing and constructing local solutions that increase the capacity of the sewerage system. (United Utilities Group PLC, 2011, p.6)"*

The above extract taken from United Utilities Group PLC's adaptation plan submitted to Defra is exemplary of the typical kind of discussion on climate risks and planned adaptation actions companies have. They identify specific climate and weather conditions that will impact particular parts of their infrastructure and asset portfolio. Indeed, in the Annual report of E.ON UK, they cite and provide business examples of specific impacts climate change (e.g., above-average temperatures that reduce the cooling efficiency of generation assets) could have on their business performance, for example:

> *"Climate change has become a central risk factor. For example, E.ON's operations could be adversely affected by the absence of precipitation or above-average temperatures that reduce the cooling efficiency of our generation assets and may make it necessary to shut them down. Extreme weather or long-term climatic change could also affect wind power generation. Alongside risks to our energy production, there are also risks that could lead to the disruption of offsite activities, such as transportation, communications, water supply, waste removal, and so forth. Increasingly, our investors and customers expect us to play an active leadership role in environmental issues like climate change and water conservation. Our failure to meet these expectations could increase the risk to our business by reducing the capital market's willingness to invest in our company and the public's trust in our brand." (E.ON UK, 2014, p. 68)*

The granularity of reporting suggests climate change is a primary business risk the company actively manages. By providing business examples the company is able to demonstrate it is not only aware of its risks and opportunities from climate change but is actually taking steps to address them. Thus signalling to interested stakeholders that climate change is a priority.

Notably, although it is commonly assumed that the more information made readily available is a good thing it is possible that the disclosure of large volumes of information could be problematic for interested parties lacking the sufficient capacity or expertise to analyse and use that information accordingly. This is because the volume of information affects a stakeholder's ability to find relevant information, as they "do not know how to find the "needle in the haystack" or even what to look for" (Gupta, 2008, p.4).

5.2.2 Distribution of disclosure by type of climate information

From the different levels of disclosure identified, and the number of companies identified as reporting on climate change, it is easy to assume climate reporting has evolved into a widespread business practice. However, the generalised nature of this assumption disguises the distinction between the number of companies doing carbon reporting and those doing adaptation reporting. Of 176 companies in the sample the vast majority (93%) publicly disclose carbon information discussing how they are managing, preventing or reducing their GHG emissions, carbon footprint,

associated waste management, and/or energy and water consumption and strategies. Conversely only 28% of 176 companies sampled publicly reference climate change adaptation as a corporate practice. What's more, not all of these companies (21) actually explain what climate change adaptation means to them, instead they simply reference that it is a climate response they are engaged with or looking into. For example, in RELX Group's Climate Change Statement the company cites a belief that climate adaptation is necessary alongside climate mitigation, but do not explain what it is they think is necessary:

> *"We support mitigation activities to reduce climate change, including reducing deforestation and protecting rainforests. We believe adaptation to cope with changes in climate is also necessary." (RELX Group, 2013)*

The remaining 29 companies provide some explanation by publicly discussing how they are reducing vulnerabilities and building or enhancing resiliency to the impacts of climate change by upgrading existing infrastructure to cope with projected weather extremes; incorporating new standards of resiliency in the design of new projects with long lifetimes; and/or (re)assess and (re)write strategies for specific hazard events such as flooding or droughts.

Upon closer examination of how this information is disclosed indicates that adaptation information is supplemental. That is to say, the disclosure of adaptation information occurs in addition to carbon information. It was found all 50 companies disclosing adaptation information also disclose information about their carbon emissions. No company discussed adaptation without also saying something about their carbon emissions. Whereas 113 of 176 companies disclose carbon information without making any reference to adaptation. The figures mirror findings of previous studies (Agrawala *et al*., 2011; Knox-Hayes and Levy, 2011; CDP, 2012; Biagini and Miller, 2013; CDP, 2013a) that identified engagement with climate adaptation in corporate business strategies and operations is weak in comparison to climate mitigation, and is restricted to a few companies. Thus, climate adaptation appears to be a secondary response. The consequence of this difference in frequency suggests what is measured and (for the most part) why is relatively clear for carbon accounting, both contrasts to adaptation reporting.

Taking into account previous research and wider climate policy rhetoric this difference is likely to exist because of the following reasons. First, historically, climate adaptation has been a marginalised policy option. Domestic and international climate policies have primarily focused on addressing GHG emissions (Füssel and Klein, 2006; Pielke Jr *et al*., 2007; Preston *et al*., 2011). For example, the headline purpose of the 1997 Kyoto Protocol was to commit its parties to binding emission reduction targets. Similarly, consecutive domestic UK climate policies and Government and non-Government reporting frameworks introduced in the last 15 years have focused on reducing and collecting GHG emissions data, with adaptation reporting or thinking largely absent (see Chapter 4). Therefore, companies are likely to have become accustomed to doing some form of carbon reporting without really thinking about climate adaptation.

Second, of the adaptation regulation that does exist (e.g., the ARP) it only affects a select group of companies in the sample – 60 of 176, all of which are critical infrastructure providers (e.g., Energy utility, Transport, and Water companies). The lack of adaptation reporting is arguably a consequence of the limited scope of influence the ARP has on the business community. As Baglee *et al.*, (2012, p.xiii) reflected "there is a no regulatory requirement on most businesses to report on risks associated with either current and future impacts of climate change on its sector, or on its proposals for adapting to climate change (other than those organisations who will report under the Adaptation Reporting Power)". Regulation puts issues on the agendas for many companies and has been shown to be a key driver of action (Agrawala *et al.*, 2011; Averchenkova *et al.*, 2015). Therefore, with many companies not required to engage in adaptation reporting, there are less incentivise to do so.

Third, adaptation reporting and adapting have traditionally been considered irresponsible and an unethical practice because it seemed to accept climate change and to detract from mitigating its causes (Pielke Jr *et al.*, 2007; Kahn and Timmons Roberts, 2013). It was "a distraction from the real work, which was reducing emissions' (Kahn and Timmons Roberts, 2013, p.171). Shrouded in negativity, and with a cultural and political bias against adaptation, there are likely to be less reputational incentives for companies to engage in climate adaptation. Many companies may perceive that climate adaptation is only going to create a bad news story if they do it.

Finally, whereas quantitatively monitoring GHG emission reductions is relatively easy, it is much more difficult to measure and monitor the effectiveness of adaptation measures (Füssel and Klein, 2006). The difficulty in quantifying adaptation may deter companies from establishing procedures for adaptation reporting because they may not be able to interpret the data once collected. This is compounded by the fact that many adaptation measures not only require significant upfront investment, but there will be little indication about the success or failure until long into the future or after an event of significance has rigorously tested it (Agrawala *et al.*, 2011; Markandya *et al.*, 2014). Therefore companies maybe less incentivised to act. By contrast carbon reporting lends itself to more traditional forms of accounting. Emission totals can be easily calculated on a yearly basis, and then compared consistently. This application may explain why it appears to be a common reporting practice across the business community.

5.2.3 Sector variations

Having identified four levels of disclosure and a clear difference in the type of climate information disclosed, this section explores whether disclosure practices—volume, detail, assiduousness, and type of the climate information they report—vary by industry sector. With eleven broad sectors represented in the sample (for a full list of industries see 'Appendix A: Sample Universe'), there is scope for exploring the hypothesis of Ihlen (2009, p. 253) "that the type of industry is an important factor [on disclosure], as environmental impact varies greatly across different sectors". Findings presented here suggest that there is indeed some sectoral influence on the level and type of climate disclosures.

In particular, there is sector variation between their levels of disclosure tendencies. Table 5-b lists the percentage of companies per level of disclosure for each sector.

Table 5-b: Percentage of companies per level of disclosure for each sector. *n* represents 'number of companies'. The industry sector classifications are based on combination of similar categorisations used by CDP (2012), Defra (2009), and the London Stock Exchange's FTSE 100 Index.

Industry sector	Level 0 'Non-disclosure'	Level 1 'Limited data and text'	Level 2 'Basic data and text'	Level 3 'Detailed data and text'
Consumer discretionary *(n=20)*		20% *(n=4)*	45% *(n=9)*	35% *(n=7)*
Consumer staple *(n=13)*			46% *(n=6)*	54% *(n=7)*
Energy utility *(n=22)*	23% *(n=5)*	4% *(n=1)*	18% *(n=4)*	55% *(n=12)*
Extractive *(n=22)*	4% *(n=1)*	18% *(n=4)*	41% *(n=9)*	37% *(n=8)*
Financial service *(n=25)*	4% *(n=1)*	16% *(n=4)*	32% *(n=8)*	48% *(n=12)*
Healthcare *(n=8)*	25% *(n=2)*	13% *(n=1)*	25% *(n=2)*	37% *(n=3)*
Industrial *(n=18)*		16% *(n=3)*	78% *(n=14)*	6% *(n=1)*
Information technology *(n=5)*			60% *(n=3)*	40% *(n=2)*
Telecommunication *(n=4)*			25% *(n=1)*	75% *(n=3)*
Transport *(n=20)*	20% *(n=4)*	25% *(n=5)*	40% *(n=8)*	15% *(n=3)*
Water *(n=19)*		5% *(n=1)*	16% *(n=3)*	79% *(n=15)*

All sectors have more than half of their (total sampled) companies classified in disclosure levels 2 or 3 (Table 5-b). Non-disclosing companies (i.e., Level 0 'Non-disclosure') are not only in the minority, but also spread across five sectors—Energy utility, Extractive, Financial service, Healthcare, and Transport (Table 5-b)—which suggests no sector is particularly averse to climate reporting. In addition to this observation, using figures in Table 5-b, the following generalised statements can be made about the consistency in volume, detail, and assiduousness of climate reporting within sectors.

Climate reporting is least consistent in the Healthcare sector with companies spread fairly evenly across the four levels of disclosure (Table 5-b). While this observation may have occurred

because of the small sample (8), the sector's characteristics suggest some reasons for this observation. Healthcare companies—which are mostly pharmaceutical and biotechnology (7 of 8)—despite large operational functions in research and development, and production, are less energy intensive and environmentally sensitive (to the direct impacts of climate change) than resource-based companies such as Extractive firms, but are more so than out and out service-based companies like Financial service (The Conference Board, 2013). Therefore, it is possible climate change might not be foremost in the company's business strategy, as well as less of a priority to their stakeholders (e.g., shareholders, potential investors, clients, customers). Moreover, Healthcare companies have only recently been statutory obligated (through the MCR) to disclose climate information publicly (in their Annual report). They are not economically regulated nor do they have any other obligation to publicly report on climate change. Furthermore, given the highly competitive nature of the sector, climate information may be perceived as commercially sensitivity material, which would encourage non-disclosure.

Climate reporting has more consistency across the remaining sectors, which suggests some standardisation in the disclosure of climate information. For Consumer discretionary, Extractive, Industrial, Information technology, and Transport sectors at least 40% of their companies are classified in disclosure level 2 (Table 5-b). This observation, of greater disclosure and consistency in climate reporting, may occur for Extractive, and Industrial companies because of their high environmental sensitivity. Cho and Patten (2007), and Jose and Lee (2007) found companies in environmentally sensitive sectors are more inclined to publish environmental information than companies in less sensitive sectors. This was partly due to their strong desire to manage social pressures that exist because of their large environmental footprint. For the remaining sectors—Consumer discretionary, and Transport—their consumer facing nature creates a set of client and customer pressures to be environmentally (socially and ethically) sustainable. Failure to do so may lose them business to competitors. By disclosing information companies are able to alleviate some of this social pressure (Suchman, 1995; Fombrun *et al.*, 2000; Levy and Egan, 2003; Perrini, 2006; Gupta, 2008; Toffel and Short, 2011; Nyberg and Wright, 2012; Mastioff *et al.*, 2013).

The remaining five sectors—Consumer staple, Energy utility, Financial service, Telecommunication, and Water—have the highest consistency in climate reporting with at least 73% of their companies classified in disclosure levels 2 and 3 (Table 5-b). In fact, 48% or more provide detailed accounts of their climate change activities (Table 5-b); with Telecommunication (75%), and Water (79%) companies on average identified as disclosing the most climate information, which suggests they are the most engaged with climate change (Table 5-b). This observation may have occurred because both sectors have experienced weather extremes that have directly and indirectly impacted their operations (e.g., damage to telephone lines for Telecommunication, or damage to drainage networks for Water) highlighting a variety of social-economic risks which many are now seeking to minimise through reporting (Dlugolecki and Lafeld, 2005; Horrocks *et al.*, 2010; Agrawala *et al.*, 2011; Ofcom, 2011; Amado *et al.*, 2012; CDP, 2014a; 2014b; Averchenkova *et al.*, 2015). Companies in this group are consumer facing. According to

Ihlen (2009) these companies are more likely to place emphasis on legitimacy-enhancing strategies such as social and environmental reporting, or in this case climate reporting because of social pressures to do more (Pfeifer and Sullivan, 2008; Ihlen, 2009; Ceres, 2010; CDP, 2011; Knox-Hayes and Levy, 2011; Jira and Toffel, 2013; Kauffmann *et al.*, 2012; Okereke *et al.*, 2012; Sullivan and Gouldson, 2012; Carbon Clear, 2014; CDP, 2014a; 2014b; Covington and Thamotheram, 2014). Additionally for Energy utility, and Water companies they may be more used to public disclosure because they have a statutory obligation to include climate information in the business strategy submitted to their regulator (Bakker, 2000; Berkhout *et al.*, 2006; Arnell and Delaney, 2006; Wilby and Vaughan, 2011).

Table 5b also indicates there is a higher tendency for sectors mandated to do carbon and adaptation reporting (e.g., Energy utility, Transport, and Water firms) to disclose more climate information than non-mandated companies. This further suggests that climate regulation may be a big rationale for reporting publicly.

Another way to explore sectoral variety in climate reporting is to consider the different types of climate information disclosed by different sectors. Figure 5-1 illustrates this distribution of companies per sector by whether they are a) non-disclosure (i.e., not reporting), b) carbon reporting only, c) carbon reporting in detail but reference climate change adaptation, and d) both carbon reporting and adaptation reporting. It shows that regardless of sector carbon reporting is the most common form of climate information disclosed.

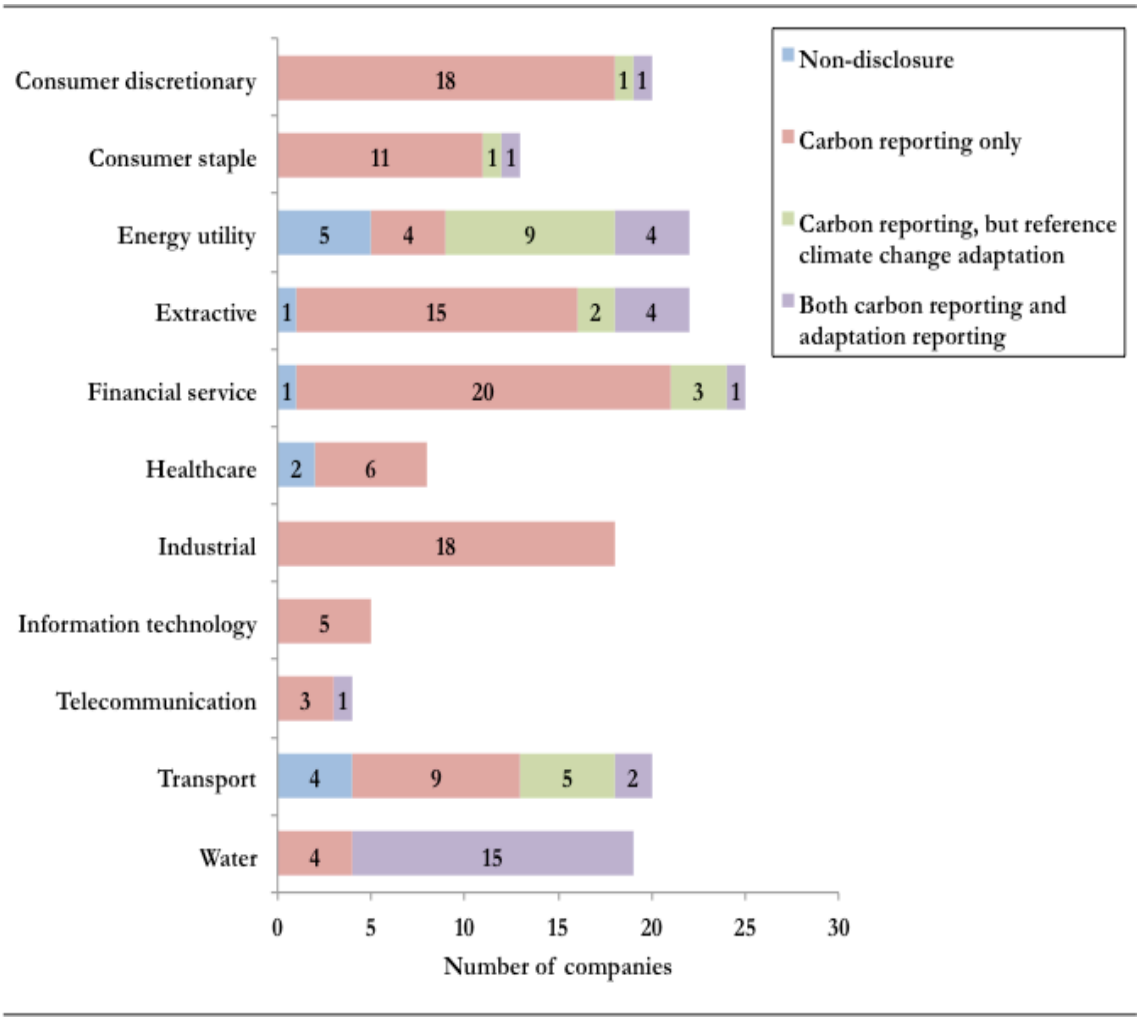

Figure 5-1: Distribution of companies per sector per type of climate information disclosed

Figure 5-1 indicates for 9 of 11 sectors—Consumer discretionary, Consumer staple, Extractive, Financial service, Healthcare, Industrial, Information technology, Telecommunication, and Transport—most companies (at least 45% of their firms) are only doing carbon reporting. This observation may be due to the fact that all of these sectors have a statutory obligation to do carbon reporting and only Transport have to do adaptation reporting. For most of the sampled companies there is no regulatory compulsion to engage with climate adaptation.

Although Figure 5-1 indicates 8 of 11 sectors—Consumer discretionary, Consumer staple, Energy utility, Extractive, Financial service, Transport, and Water—have companies that do adaptation reporting, only Energy utility, and Water sectors have a significant number of firms (at least 59%) talking about climate adaptation alongside carbon reporting (Figure 5-1). In contrast to the 9 other sectors, both Energy utility and Water companies were subject to the ARP's first round of reporting, and are economically regulated to include climate information in their business strategy. Therefore, they have been statutory obligated to engage in adaptation reporting, which may be a contributing factor in their reporting practice because there is a higher tendency for ARP mandated companies—Energy utility, Transport, and Water—to disclose more adaptation information than non-mandated companies (Figure 5-1). This suggests adaptation regulation may

influence corporate decisions to reporting publicly. At the same time both sectors are environmentally sensitive, and consumer facing. Consequently, they are likely to face a variety of social pressures to engage more deeply into climate reporting.

Given the potential importance of regulation in getting companies to disclose more information, and talk about climate mitigation and adaptation in unison, it is important to consider if there is sector variety in climate reporting by the different types of mandatory requirements to which different sectors are subject. Figure 5-2 plots the distribution of companies per level of disclosure by a) sector, and b) type of mandatory requirement companies are obligated to respond to (e.g., MCR and/or ARP). It shows that the level of disclosure (i.e., volume of disclosed climate information by a company) is not dependent on the type of climate reporting they are required to do, but there is a likelihood that companies will do more reporting because they have to engage in more.

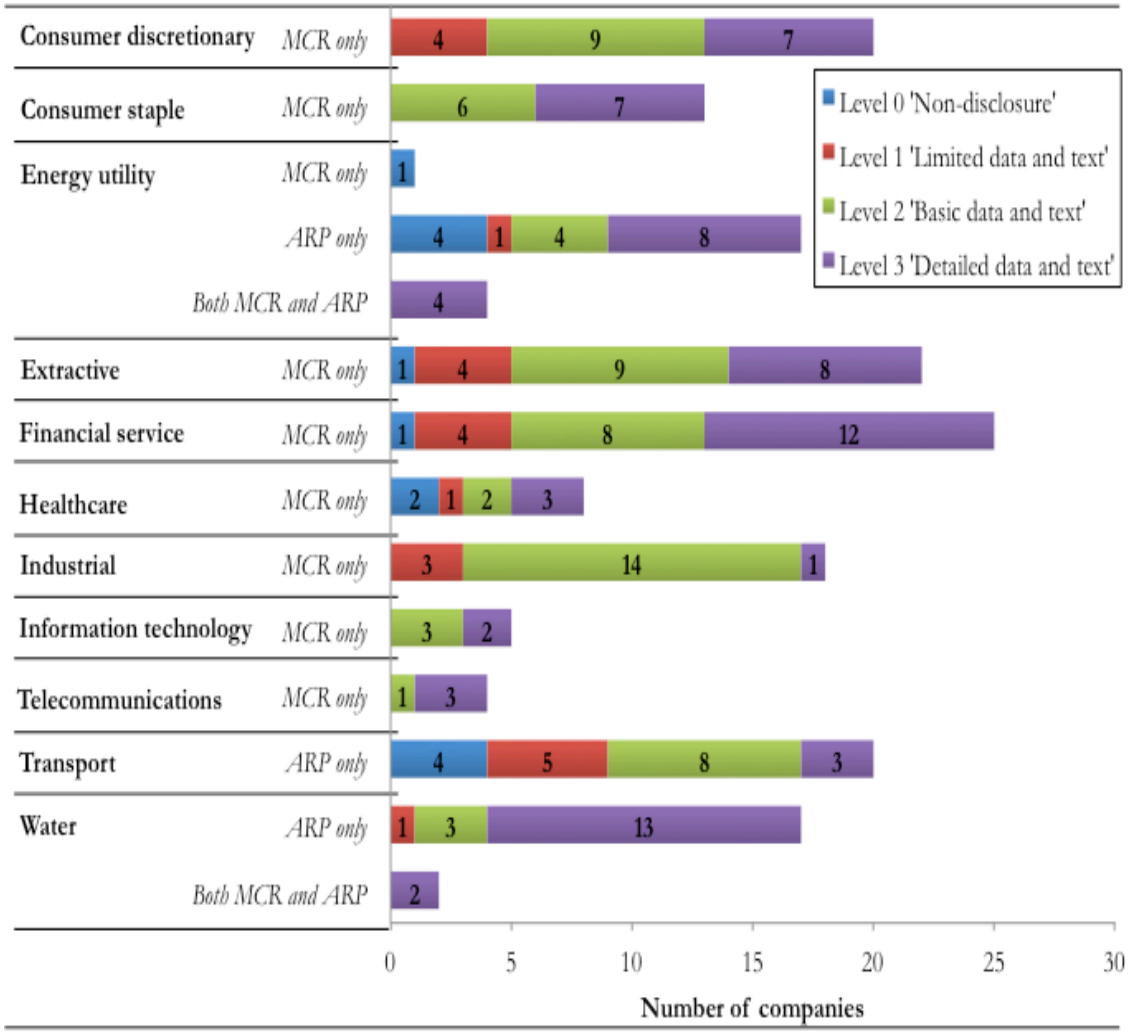

Figure 5-2: The distribution of companies per level of disclosure by sector and type of Government reporting requirement. MCR equals 'Mandatory Carbon Reporting'; ARP equals 'Adaptation Reporting Power'. Of 176 companies, 116 are only required to respond to the MCR, 54 are only required to respond to the ARP, and 6 are subject to both requirements.

In particular, Figure 5-2 indicates for both reporting requirements the combined proportion of companies categorised in levels 2 and 3 is greater than those in levels 0 and 1. Specifically, at least 63% of MCR only reporting authorities and 55% of ARP only reporting authorities are categorised in levels 2 or 3. Equally, without exception, all 6 companies reporting to both the MCR and ARP are categorised in the highest level of disclosure (however, their decision may be influenced by the fact they have more climate information available for disclosure). This suggests regulation, regardless of type, is an important factor influencing reporting practice.

5.3 Framing Climate Change: Dominant Discourses

5.3.1 Identifying discourses

Three generic discourses of climate reporting were identified by the way companies framed—form or articulate—climate information regardless of type (e.g., carbon or adaptation) disclosed on their website and in their Annual report and/or CSR report. These discourses are the 'rhetoric strategies' companies employ to persuade stakeholders that they are coping with climate change issues appropriately (Ihlen, 2009).

Table 5-c: Generic discourses of reporting on climate change

Discourse	Frame	Characteristics
1 *Win-win scenarios*	*Financial*	Reduced operation expenditure, but also increased reporting costs
	Opportunism	Areas of weakness across the business are identified that can now be or have been addressed. Chance to develop new technology, make the supply chain more robust, gain new business
2 *Legitimacy-enhancing strategies*	*Good corporate citizen*	Integrate social, ethical, environmental, economic and philanthropic values in core decision making processes of the company
	Reputation management	The practice of attempting to shape public perception of a person or organization by influencing online information about that entity
3 *Reactionary responses*	*Regulatory compliance*	Adherence to laws, regulations, guidelines and specifications relevant to the company
	Being auditable	The quality and degree of being understood and comparability to peers or reporting standards

Notably, the discourses listed in Table 5-c are consistent with the three broad organisation reporting perspectives discussed in Chapter 2. Specifically, discourse 1 'win-win scenarios' (Table 5-c) comprises of frames that emphasise how reporting on climate change has not only better

informed the management of business operations but also improved the company's performance (Kolk and Pinkse, 2004; Hoffman, 2005; Porter and Reinhardt, 2007; Gouldson *et al*., 2008; Kolk *et al*., 2008; Knox-Hayes and Levy, 2011). Discourse 2 'legitimacy-enhancing strategies' (Table 5-c) comprises of frames distinctly positive in nature that appear to be more concerned with putting the company in good light as opposed simply to being informative (Sullivan, 2008; Ihlen, 2009; Lyon and Maxwell, 2011; Nyberg and Wright, 2012; Okereke *et al*., 2012; Sullivan and Gouldson, 2012). And discourse 3 'reactionary responses' (Table 5-c) comprises of frames that are reacting to external pressure and which suggest that reporting is performed to comply with regulation or because the company wants to be auditable (Jones and Levy, 2007; Eberlein and Matten, 2009; Andrew and Cortese, 2011a; 2011b; Kauffman *et al*., 2012; Gasbarro, 2013).

Before discussing each discourse through their subset of frames it is important to recognise discourses are not employed exclusively. Climate information often invokes multiple frames, shifting from one framing to another in different contexts within the same report or website section. For example, in the space of three pages, Amec Foster Wheeler plc in their '2013 Annual Sustainability Performance Report' employed multiple framings that represent all three discourses to communicate their GHG emissions performance. Specifically, they began by claiming that doing climate reporting has been economically beneficial to the company because it has improved their awareness of the cost benefit of carbon reduction:

> *"..our success has also been helped by […] greater awareness of the cost benefit of carbon reduction." (Amec Foster Wheeler plc, 2014, p.46)*

This statement denotes a win-win discourse. At the same time, in the same paragraph, emissions performance data is framed as overtly positive:

> *"…we can confirm that we have achieved our first milestone target of a 15 per cent reduction in carbon." (Amec Foster Wheeler plc, 2014, p.46)*

By framing emissions performance data in a positive light a reputation management frame is invoked because the company is communicating in way that encourages interested parties to see their practice as that of a good corporate citizen reducing their emissions. Finally, they state their reporting methodology is in line with recognised standards:

> *"AMEC has been reporting in line with legal and voluntary carbon reporting requirements such as the Carbon Reduction Commitment, Carbon Disclosure Project and the Dow Jones Sustainability Index for the last five consecutive years." (Amec Foster Wheeler plc, 2014, p.48)*

By communicating this fact the company is making sure interested parties jnow they operate in accordance with the reporting requirements.

Moreover, even many interview responses to questions about why and how their company reports go back-and-forth between all three frames. For instance the following interviewee reflected their reporting was influenced by its regulatory environment, their desire to manage their corporate reputation, but also ensure their profitability:

> *"It is mainly regulators, shareholders, and public perception, but also in truth because we are a regulated business. Having said that, the more we start looking into sustainability and climate change because of these factors the more we start seeing cash benefits too." (Energy utility A, Interview 3)*

The company's reporting is simultaneously motivated by a desire to comply with regulation, manage stakeholder relationships, and protect profit.

The interchangeable nature of frames disguises the distinction between different sector reporting tendencies. Therefore, given disclosures are characterised by multiple frames and exhibit more than one discourse, it is not possible to attribute a central tendency or single framing to a company or sector. As such, this analysis that follows will not discuss and compare the framing tendencies of sectors or type of climate information. These comparisons will be undertaken in the next two chapters, which will use the following discussion to help address similar analytical themes that tease out similarities and differences in reporting rationales, practices and impacts.

5.3.2 Discourse 1 'Win-win scenarios'

One discourse of social and environmental reporting (and action) exhibits a belief that environmental protection and improvements will fulfil wider economic and social goals (Hajer, 1993; 1995; Gibbs, 2000; Gouldson *et al.*, 2008). In similar circumstances discourse 1 includes frames that portray corporate engagement with and management of climate change as a 'win-win scenario' (Table 5-c). The argument is that simply by reporting on climate change and taking preparatory action a company can protect itself from climate risks and reduce its contribution to the wider problem, while simultaneously improving its bottom line. In this context companies' often "express the view that climate change not only poses a problem in the form of increased risk, but that it also constitutes a business opportunity" (Ihlen, 2009, p.256).

> *"By addressing the physical and regulatory risks associated with climate change – through technology, partnerships and operational improvements – we can operate more responsibly and efficiently." (InterContinental Hotels Group PLC, 2014, p.52)*

Reporting, as exemplified above, will not only inform readers about a company's climate risks and acknowledge their contribution, but also defines taking action and implementing initiatives as a way to improve business performance. As a result, companies often assert that better climate performance will lead to healthier social and economic performance (Kolk *et al.*, 2008). They habitually subscribe to frames that strongly echo the win-win language of eco-modernsim (Hajer, 1993; 1995). For example:

> *"Reducing our carbon footprint helps us to manage our costs, as well as the impact of our operations on climate change, as we spend around £2.9 million a year on electricity" (Semcorp Bournemouth Water Ltd, 2014, p. 21).*

It is typical to see companies making claims (like above) that reducing their carbon footprint has the dual benefit of increasing profitability by reducing the environmental and climate impact of their operations (e.g., GHG emissions from productivity).

In addition to financial benefits, companies also emphasised the potential opportunities for new business (Table 5-c) as a result of climate change impacts experienced by others (e.g., clients, consumers); an indirect win-win scenario. Such a "business opportunity in question seems most often to be the 'first mover advantage', that is, earning profits because of a corporate pioneering role that, for instance, sets the company apart from its competitors" (Ihlen, 2009, p.256). For example, Vodafone Group Plc, a provider of machine-to-machine solutions, state on their website that their technology is best placed to assist others in tackling climate risks:

> *"…[our technology] enable our enterprise customers to cut costs and carbon emissions by reducing their energy and fuel use and improving the efficiency of their operations". (Vodafone Group Plc, 2014)*

Vodafone Group Plc go on to recognise the opportunity for business growth by delivering services that cater to demands to reduce GHG emissions, waste and inefficiency, as well as building resiliency into systems. Climate change then presents companies with opportunities to attract more business as others seek smart solutions to ensure their continuity. Thus HSBC Holdings plc (2013) assert that their financial services expertise will help support business' transition to a low-carbon economy. While these examples focus on companies in service-based industries the same framing is used by resource-based companies, where you might least expect it. Royal Dutch Shell plc, for instance, note in their 2013 Annual Report that climate change induced growth in energy demand provides them with opportunities for business growth by developing and providing cost-effective solutions such as supplying more natural gas and biofuels, and new technologies (e.g., carbon capture and storage) to fulfil longer term demand.

While all of the examples presented here will simultaneously satisfy environmental, social and economic goals, they have a distinctly similar characteristic. All focus on so-called "low-hanging fruit" activities. They are relatively easy to accomplish if performed correctly. For instance, emissions reductions and cost savings should naturally occur if energy usage becomes more efficient. This suggests a number of reporting tendencies. Companies are motivated by easily achievable immediate gains. The immediate nature actions taken indicates a disproportionate focus of strategies and actions occurs, which may affect the degree to which reporting impacts business decisions and wider organisational cultures and behaviours. In turn the lack of long-term thinking could mean strategies for adapting are not in place (CDP, 2013a). This potentially reveals a tension between the actions companies are willing to take and the actions argued (by the literature) to be necessary for successful mitigation and adaptation to climate change.

5.3.3 Discourse 2 'Legitimacy-enhancing strategies'

The second discourse listed in Table 5-c includes a set of frames that are used for strategic reasons that have little or nothing to do with perceived responsibilities or obligations. Instead reporting aims to convince interested parties that the company is socially responsible (O'Dwyer, 1999). Climate information is framed in ways to gain or extend legitimacy, maintain current legitimacy, or

repair or defend lost or threatened legitimacy (Suchman, 1995; O'Donovan, 2002). One way this discourse is apparent is the overly positive narrative that defines the majority of climate reporting. A key aspect of this approach according to Lyon and Maxwell (2011, p.9) is the "selective disclosure of positive information about the company's social and environmental performance, without full disclosure of negative information on these dimensions, so as to create an overly positive corporate image". That is, negative performance is downplayed with a more favourable gloss used for facts and figures that might otherwise look bad if left unexplained:

> *"Electricity consumption and air travel are the areas responsible for the majority of ICAP's carbon emissions. While we have seen a decrease in air travel-related emissions, those from consumption of purchased electricity have increased. This is due primarily to increased lab capacity following the investment in new technologies and products in our EBS business. ICAP plans to reduce electricity consumption by the virtualisation of its server environment. We continue to make use of our telephone and video conferencing facilities where available and work to introduce more efficient lighting and air conditioning in our offices. Renewable energy sources are used to purchase electricity where possible, waste is recycled where facilities are available and when office moves are required a key area of focus is the environmentally friendly nature of the building." (ICAP plc, 2014, p.37)*

In this example, the company tries to 'explain away' increases in the total emissions (a bad) as a consequence of business growth (a good). The company adds further justification for this explanation by sandwiching it between some positive information on their reduced emissions from air travel, and their continued application of climate mitigation measures to address this increase.

In this way, a company's negative performance is redefined into something that will resonate with key stakeholders to enable the company to justify current management actions and climate performance (Sullivan, 2008; Ihlen, 2009). For example, increases in GHG emissions are commonly justified by business growth to protect the reputation of the company:

> *"While the growth of our Company has increased the number of our stores and therefore the absolute GHG emissions, our chosen intensity ratio of electricity-related emissions per £m revenue of 0.9% has increased only slightly from our 2012 base, partly due to the inclusion of a number of newly acquired companies" (Sports Direct International plc, 2014)*

In this instance, the company is managing their reputation by directing interested parties to the stories the company wants them to read. Specifically they not only provide an adjusted baseline (not absolute GHG emissions but relative to £m revenue) to speak to investors, but when even this adjusted baseline has gone up, the report tries to put the best face on it by attributing it to the fact that they bought other companies whose GHG emissions are not as good as their own. The result of which has temporarily resulted in a spike in their emissions that the management will soon have in hand once they have sorted out the newly acquired companies.

Bad weather events are another external factor used by companies to rationalise what they frame as merely short-term aberrations from their long-term emission reduction targets. For example:

> *"In 2012/13 our greenhouse gas emissions remained below the 2009/10 baseline of 161.7 tCO2e, however the demands placed on us due to the extreme weather meant we were unable to meet our target level for the year." (South West Water Limited, 2013, p.33)*

While South West Water Limited acknowledges missing their yearly GHG emission target, they provide a reason for this – extreme weather – and imply the overall reduction target is still being maintained. Thus, companies frame negative performance as short-term incidents that do not affect the positive performance experienced over a longer time span. This practice can be interpreted as an intention by a company to cover up bad practice to manipulate and persuade key stakeholders that their performance is sound or better than it is in reality (Laufer, 2003; Vos, 2009; Mahoney *et al.*, 2013).

Another theme that regularly appears which denotes legitimacy seeking is the citing of participation in voluntary indexes and the receiving of awards for performing well:

> *"In 2013 we achieved an impressive seven per cent reduction in carbon emissions, a total of 18 per cent over two years and were awarded Gold in the annual Business in the Community CR Index." (Intu Properties plc, 2014, p.10)*

Moreover, companies will publicise climate awards, accolades, and national accreditation they have received for good climate performance:

> *"We are proud to have been recognised for our efforts by socially responsible investment rating agencies and to be named to the Carbon Disclosure Leadership Index, the FTSE4Good Index and the Maplecroft Climate Innovation Index." (Carnival Corporation plc, 2006)*

They also discuss favourable climate performance in relation to peers:

> *"For the fifth year in succession, Old Mutual has retained their place on the CDP Climate Disclosure Leadership Index (CDLI), rising from eighth to fifth position in the finance sector." (Old Mutual, 2014)*

Stressing these achievements informs interested parties about some of the firm's desirable green credentials. It lets them know that the company's reporting practice has been assured externally as credible and legitimate, which are valuable characteristics to many stakeholders (Gouldson and Sullivan; 2007; Kolk, 2008). The manner in which companies present their achievements raises an interesting question about the motivation to report to voluntary indexes. Few companies explain how and why reporting to these indexes' is beneficial to the business. Instead, as the above extracts demonstrate, the majority of companies merely list climate achievements. Arguably this suggests having the award and being able to say you have the award is more important than the process or outcomes involved in achieving it. If this is indeed the case (as will be explored in the next two chapters) participation in climate standards or awards is more about ticking boxes to fulfil stakeholder interests than improving their climate management practices (Lapsley, 2008; Stubbs *et al.*, 2013). This may also be the case for companies that cite climate change adaptation on their website that do not actually provide details about measures. Arguably companies are more concerned about creating an impression amongst stakeholders that they are doing something without going into detail to explain what.

Another way companies can protect their reputation and create legitimacy is to present the company as doing actions which extend beyond profit-making for the collective welfare of society

(Carroll, 1998; Fombrun *et al.*, 2000; Matten and Crane, 2005; Nyberg and Wright, 2012). Companies often claim their actions are in support of Government climate change targets:

> *"Our Climate Change Statement indicates our support for the globally recognised target of an 80% absolute reduction in CO_2 emissions by 2050. It also outlines our commitment to mitigation and adaptation and our belief in the need for an ambitious, robust, and equitable policy on climate change. As such, we continue to engage with governments on climate change regulation. As an endorser of the UN Global Compact's Caring for Climate initiative, and through the European Network for Sustainable Business, we share good practice with others and support voluntary codes of practice" (RELX Group, 2014, p.57)*

Climate change represents a considerable challenge to wider society. By making cases like above—that their actions support Government's goals, that they are committed to addressing their contribution to and managing impacts from changes in climate, and citing reporting practice is in accordance with others—companies can defend their reputation by presenting themselves as a 'good corporate citizen'. By highlighting their ethical climate practices, as well as showcasing good-natured climate activities, the company paints itself as a picture of corporate responsibility in the hope of thereby enhancing its own legitimacy amongst peers and interested stakeholders (Vos, 2009; Lyon and Maxwell, 2011; Mahoney *et al.*, 2013). Indeed, Ashmore Group plc, a specialist Emerging Markets investment manager, stress they are committed to environmental responsibility despite perceiving themselves as having a negligible contribution in comparison to other types of businesses:

> *"As a company whose business is fundamentally based on intellectual capital and does not own its business premises, Ashmore has a limited direct impact on the environment but nevertheless recognises that we have a responsibility to manage this as effectively as possible" (Ashmore Group plc, 2014, p. 17).*

Framing climate change in this way reduces the risk of being criticised for not fully participating or doing as much as other businesses. Simply expressing care for the environment and stating they are tackling their contribution to climate change could be an important strategy companies use to enhance legitimacy.

5.3.4 Discourse 3 'Reactionary responses'

A third discourse includes frames that indicate climate reporting is performed as a response to climate regulation (Table 5-c). UK companies are subject to multiple mandatory requirements to report on climate change (see Chapter 4). Companies widely cite compliance with mandatory requirements in the climate information they disclose. For example:

> *"We regard compliance with applicable legislation as a minimum level of achievement and we will comply with other requirements which relate to our environmental aspects" (Drax Group plc, 2014)*

Complying with these regulatory reporting requirements protects a company from financial penalties and any negative publicity that may arise from being sanctioned for failing to report adequately (Hoffman, 2004; Gouldson and Bebbington, 2007; Eberlein and Matten, 2009; Reid and

Toffel, 2009). As a result companies will often state that an essential business practice is to keep up-to-date with climate regulation:

> *"We have also identified climate change-related regulation as a material issue for the Company (see page 51). We monitor and are prepared for regulatory proposals on climate change – such as the UK Government's mandatory greenhouse gas reporting requirements" (Tui Travel plc, 2014, p. 30).*

Indeed, this is common for companies mandated to respond to the MCR. They will state the GHG emissions data calculated and recorded is in accordance with the reporting guidelines:

> *"In line with new requirements set out in the Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013, this statement reports the Company's GHG emissions for the reporting period 1 October 2012 to 30 September 2013. A different reporting period from our financial reporting year has been selected, in accordance with the DEFRA Environmental Reporting Guidance, to avoid the use of estimated utility consumption data. The data has been calculated and recorded in accordance with the GHG Protocol and ISO 14064." (Hammerson plc, 2014, p.28)*

Likewise companies reporting to the ARP will state adaptation information is reported in accordance and in response to the requirement:

> *"The Port has obligations under the Climate Change Act 2008 to report on adaptation to climate change." (Port of Milford Haven, 2013, p.7)*

The intentions of such statements are to signal to stakeholders that the company is doing what is asked of them. On the one hand such statements inform key stakeholders the company is not breaking the law. Their actions are performed in accordance with the necessary standards of whatever mandatory requirement they have to respond to. On the other hand such statements could be about ensuring they are auditable and comparable to their peers to minimise the likelihood of negative repercussions for their business performance. These themes will be explored in Chapters 6 and 7.

5.4 Conclusions

As corporate attention for climate change has increased so has momentum for climate reporting. Increasing numbers of companies are disclosing greater quantities of data, albeit variation remains in the degree of detail. Some companies just cite climate change is a risk like any other business risk they face, whilst other companies provide itemised accounts of their GHG emissions and practices for reducing these, as well as information on how they are adapting to climate change. From this it is possible to construct four broad levels of disclosure. Level 0 companies do not disclose any climate information. Level 1 companies provide some climate information, but detail is limited and any accompanying discussion lacks depth. Level 2 companies provide basic sets of climate data in tables or figures and reflect on their contribution and management of climate risks and opportunities. Level 3 companies provide comprehensive and detailed climate information but it is easy to follow because of the terminology, structure, tables, and infographics used to visualise data.

However, there are differences in the volume of reporting on carbon and adaptation. Whereas carbon reporting is common (93% of 176 companies), few perform adaptation reporting (28% of 176 companies). There also appear to be differences between sectors. Environmentally sensitive and economically regulated companies appear to disclose the most amount of detailed information than other types of sectors. That is, Energy utility, and Water companies in particular. It also appears that sectors subject to multiple types of climate regulation (e.g., the MCR and ARP) are more likely disclose information than non-mandated companies. Being regulated to report appears to have some influence on getting companies to report. Why these observations occur will be explored in the next two chapters.

Analysis of publicly available climate information indicates there are three dominant discourses of reporting, each involving discrete frames of win-win scenarios, legitimacy-enhancing strategies, and reactionary responses. These specific discourses of climate reporting broadly correspond to existing accounts of social and environmental reporting in the literature, which approach corporate environmental reporting in terms of ecological modernisation, greenwashing, and audit culture. Significantly, while the climate discourses identified here appear in both genres of reporting (e.g., carbon reporting and adaptation reporting) they point towards somewhat different rationales, approaches, and impacts of reporting on carbon and/or adaptation, which will be explored in the next two chapters respectively.

Chapter 6 Corporate Carbon Reporting: Rationales, Practices, and Impacts

6.1 Introduction

The UK has set itself a legally-binding target to reduce net carbon (for all six Kyoto Protocol GHG) emissions by at least 80% (from the 1990 baseline) by 2050 (Climate Change Act 2008). The response of the business community will substantially determine whether this target is achieved. Findings from Chapter 5 indicate the UK business community is actively engaged in carbon reporting, which might be interpreted as a sign that things are heading in the right direction. But recording and then, publicly disclosing information about emissions is not the same thing as actually reducing them. As we saw in the last chapter there is wide range of climate reporting discourses and practices. Those patterns suggest that there may be important differences among firms and sectors in the degree to which they are actually meaningfully engaged in climate mitigation beyond reporting.

Therefore, this chapter explores how and why companies engage in carbon reporting and what effect those disclosures have on organisational performance and behaviour. It utilises the three broad organisational reporting perspectives presented in Chapter 2—ecological modernisation, greenwashing, and audit culture—to analyse organisational rationales for, practices of, and responses to carbon reporting. The chapter draws upon the data collected from the desktop review of Annual reports, corporate websites, and other corporate documents of 176 leading UK-registered firms and 36 interviews with individuals working for a purposeful sample of companies in the case-study sectors (e.g., Energy utility, Extractive, Financial service, and Water), as well as a further 24 third party conversations with Government officials, Regulators, Consultants and Independent body organisations (see Chapter 3 for further details on data and methods).

The chapter is divided into four sections. Section one reviews the rationales for carbon reporting and distils several widely observable drivers for carbon disclosures. Section two then describes the processes and practices of carbon reporting and discusses how they vary across the sample. Section three assesses the impacts of carbon reporting on corporate support for mitigation and whether carbon reporting is coupled to the implementation of strategies for reducing those emissions. This then leads to a fourth discussion section that draws together findings from the three previous sections—rationales, approaches and impacts—to consider sectoral and other differences in whether, how and why carbon reporting affects business performance. The chapter ends by summarising the main points, and argues carbon reporting is a strategic corporate practice.

6.2 Rationales for Carbon Reporting

The desktop review and interview responses point to three general drivers for carbon reporting. A first driver is connected to financial reasoning (Kolk and Pinkse, 2004; Hoffman, 2005; Porter and

Reinhardt, 2007; Knox-Hayes and Levy, 2011). Emissions are inextricably linked to energy consumption which, particularly for energy intensive companies, is a major contributor to net corporate expenditure.

> *"Improving energy efficiency is a core element of Anglo American's response to climate change, as well as an economic value driver for the business because of the increasing cost of energy and concerns related to the security of electrical energy supplies." (Anglo American plc, 2014)*

The object of carbon reporting is to identify, measure, and monitor those emissions. This can provide valuable information about how to reduce those emissions and thereby improve both environmental and financial performance:

> *"Having implemented energy efficient technology, reporting is a good proxy for progress. Most of our emissions are associated with combustion of fuel. From our perspective there is a strong alignment between cost drivers and environmental goals. The cost driver is every bit of fuel we burn costs us money. Our energy bill is massive between all of our facilities because we use a lot of electricity and natural gas and various other forms of power. Therefore, if we can reduce our energy usage we can reduce our cost and greenhouse gas emissions. Reporting helps to keep us updated." (Extractive D, Interview 4)*

For this informant's firm, reducing emissions is all about reducing costs. Accounting for its GHG emissions allows it to monitor progress and evaluate where potential reforms to operations and process optimisations can be made (i.e., where energy consumption can be cut and better managed) that will lower energy costs, and subsequently improve or sustain profitability. Carbon reporting is not seen as a burdensome environmental regulation, but good business sense, because emissions are costly and their reduction provides a proxy for the overall efficiency of the company's operations. In this instance, reporting is done because it produces a win-win outcome, whereby addressing your environmental impact yields a positive return (Hajer, 1993; 1995; Spaargaren and Mol, 1992; Gibbs, 2000; Gouldson et al., 2008; Mol *et al.*, 2009).

It is very common for company reports (two-thirds of the entire sample) to trumpet the financial benefits of reducing their GHG emissions. Typically companies provided some economic figures from being energy efficient, as well as signposting emissions reductions also occurred, for example:

> *"Our sustainability initiatives in 2013 have delivered estimated savings of £,400,000 in energy costs. The most effective changes have been achieved through the roll out of energy efficient lighting. This has generated savings of 1,045 tonnes of CO_2e. Lighting remains the biggest source of carbon emissions from retail property. We will therefore continue to focus attention on reducing demand in the areas we control and working with retailers to reduce emissions in their areas." (Hammerson plc, 2014, p.27)*

While such statements about the economic savings to be made from reporting are widely used, the efficacy of such claims by certain types of companies can be questioned. For non-energy intensive companies in the service sector, for example, there is less scope and incentive to make energy related savings. As this Financial service sector interviewee explained, their options are limited by the sources of their emissions and their ability to enact change:

> *"When you are in a business that is producing relatively modest amounts of emissions anyway there is a limitation in what you can do. How responsible it is to set reduction targets? The building we occupy, we have no influence whatsoever on the amount of electricity that is being consumed as a whole. An outside contractor manages the building. There is a charge that is levied to every occupant on every floor. We have lighting that switches off when there is no movement detected, but I am not sure what else we can do that has any meaning." (Financial service B, Interview 1)*

Since this firm rents space in a large commercial office building it cannot control how much energy is used on heating and cooling, and there are no financial incentives for using more energy efficient computers and other electrical appliances, since energy charges are not levied on tenants on the basis of usage. Even if they were, those energy-related operating costs would be tiny in comparison to remuneration, capital charges, and other expenditure for this financial services firm. While reducing business travel by encouraging video conferencing rather than international flights promises more substantial carbon saving, it was not a major business expense.

In contrast, the potential savings for energy intensive companies are much greater, and thus so too was the enthusiasm for monitoring emissions and reporting on the win-win benefits of reducing emissions. In both its ecologically modernising rationale and its rather broad brush, lack of detail, the following comment was typical of the tone adopted in Annual reports, websites, and other corporate documents from energy intensive firms:

> *"Energy accounts for over 10% of the mining division's operating costs, so improving efficiency can have significant financial, as well as environmental benefits." (Antofagasta PLC, 2014a)*

However, it is important to note that whilst energy intensive companies can claim to make significant emissions reductions, because of their activities, it is difficult for them to reduce their absolute emissions as business growth typically means emissions will increase (Sullivan, 2008). Therefore, despite claims of win-win outcomes, companies may not be telling the whole story when they report on their carbon emissions. While the stated reason is making some economic savings through their energy consumption, large emitting companies can also minimise the amount of carbon taxes they have to pay to mandatory schemes like the EU ETS. At the same time, doing such activities will curry favour with socially and environmentally conscious stakeholders (e.g., investors, shareholders, clients, environmentalists, customers, regulators, and the Government), where there are opportunities for business growth if they tick the right boxes (Reid and Toffel, 2009; Matisoff *et al.*, 2013).

Indeed, a second driver behind carbon reporting is associated with the social pressures faced by firms for more aggressive emission reduction strategies (Pfeifer and Sullivan, 2008; Ihlen, 2009; Ceres, 2010; CDP, 2011; Knox-Hayes and Levy, 2011; Jira and Toffel, 2013; Kauffman *et al.*, 2012; Okereke *et al.*, 2012; Sullivan and Gouldson, 2012; Carbon Clear, 2014; CDP, 2014a; 2014b; Covington and Thamotheram, 2014). For instance, 13 (of 36) company interview participants explicitly mentioned the growing calls from investors, shareholders and clients for their company to demonstrate year-on-year progression in regard to reducing their contribution to climate change.

> *"Nowadays more and more shareholders and potential investors and clients are becoming interested in our reporting of carbon emissions and similar climate change issues. They want to know what we are doing, and how we are reducing them." (Energy utility A, Interview 1)*

This pressure exists for several reasons. Some stakeholders use emissions data as a proxy for good management when evaluating a company's climate risks to determine whether to invest or use their services (Knox-Hayes and Levy, 2011). Likewise, companies expressed feeling similar pressure to report from regulators, the Government, and environmentalists who use emissions data to monitor and govern good practice. Some firms are also face expectations from customers who want to be assured that a company is taking appropriate cautions about protecting the environment.

This social pressure, with its multiple sources, has made companies' sensitive about damage to their 'brand' from a lack of trust in their real fundamentals, true risks, and business performance (Stanton, 1997; Eccles and DiPiazzo, 2002). Reporting allows companies to demonstrate to stakeholders that they are taking the necessary steps to tackle climate change, which helps build external confidence that management 'knows what they are doing' (Kolk and Pinkse, 2004; Hoffman, 2005; Lash and Wellington, 2007; Wittneben and Kiyar, 2009). By reporting, companies make themselves accountable to their stakeholders, the benefit of which to a company builds confidence and credibility, which helps to dissipate some of the reputational risks they are exposed to by different stakeholder groups and protect the company's reputation which has long been an objective of corporate social and environmental reporting (Suchman, 1995; Ball *et al.*, 2000; Fombrun *et al.*, 2000; Levy and Egan, 2003; Perrini, 2006; Gouldson and Bebbington, 2007; Gupta, 2008; Toffel and Short, 2011; Nyberg and Wright, 2012; Mastioff *et al.*, 2013). Therefore, perhaps what is more important is being seen to be reporting. Indeed, as this interviewee reflected about their participation in CDP's Climate Change Program, participation may form part of investors' criteria for determining which companies they should invest in.

> *"It is important that we put out to the investor community the work we are doing. It might form part of their tick box criteria, if we have CDP they might put a tick against out name, and so on." (Water E, Interview 1)*

From the interviews, it is possible to identify four ways in which companies use carbon reporting to manage their public perception. First, many companies, particularly in energy intensive sectors (e.g., Energy, Extractive), do carbon reporting with the aim of securing their licence to operate. Rio Tinto was explicit about this aim:

> *"Our GHG performance is important in upholding and extending our licence to operate. We are focusing on reducing the energy intensity of our operations as well as the carbon intensity of our energy, including through the development and implementation of innovative technologies." (Rio Tinto Group, 2014, p.11)*

It recognises the importance of reporting because adverse environmental impacts represent a major reputational risk to business growth (Dunn, 2002). Disclosing information about their GHG emissions and performance towards meeting reduction targets helps companies show that they are responsible and can be trusted to operate sustainably. In this instance carbon reporting may be used

as blame avoidance (Hood, 2002) to mitigate unfavourable public perception and stigma that they are only concerned about profit.

Second, other companies do carbon reporting as part of wider strategies to differentiate themselves from competitors in the eyes of socially and environmentally conscious customers, potential investors, shareholders and clients. In particular, voluntary carbon reporting is perceived to be an avenue that a company can "distinguish themselves from competitors and gain recognition" (Matisoff *et al.*, 2013, p.297). Indeed, as this interviewee reflected about their participation in CDP's Climate Change Program, participation may form part of potential investors' criteria for determining which companies they should invest in.

> *"It is important that we put out to the investor community the work we are doing. It might form part of their tick box criteria, if we have CDP they might put a tick against our name, and so on." (Water E, Interview 1)*

This is because CDP analyse the climate information of participating companies, and then publishes the scores in a league table that is made available to potential investors to make informed decisions about where to invest (Knox-Hayes and Levy, 2011). This creates a competitive environment where companies aim to outperform their peers to receive new investment.

> *"CDP is an added opportunity to show our investors what and how we are tackling climate change. CDP is a good platform because it allows for benchmarking. We are doing very well in our CDP financial services sector. We are leaders." (Financial service E, Interview 1)*

By establishing or maintaining the status as a sector leader, a company can argue to their stakeholders that their engagement with climate change is more meaningful than peers because a credible third-party recognised them to be. It is therefore distinctly possible that some companies may 'greenwash' material to paint a more favourable image to maximise their potential to be scored more favourably (Lyon and Maxwell, 2011), which may explain the overly positive framing of climate change information identified in Chapter 5. This raises scepticism, similarly expressed by Kim and Lyon (2011), Cho and Patten (2013), about the reliability of voluntary disclosures and the intentions of companies participating and performing well. On the one hand a number of studies assert participation reflects commitments to ecological improvement (Deegan and Gordan, 1996; Deegan and Rankin, 1996; Matisoff, 2015). But on the other hand concern has been expressed that participation is about deceptively promoting their image or reputation by shaping perceptions of interested parties rather than making true efforts to reduce harm to the environment (Meek *et al.*, 1995; Greer and Bruno, 1996; Laufer, 2003; Lyon and Maxwell, 2007; Bebbington *et al.*, 2007; Kolk *et al.*, 2008). This behaviour is attributed to the cultivation of a competitive environment that unintentionally encourages some business companies to carefully disclose corporate information that will 'sell' them as 'greener' than they actually are in order to appear better off than peers (Matisoff, 2012; 2015).

Third, there are also companies that do carbon reporting for defensive reasons. Rather than trying to out-compete competitors, participation in voluntary indexes is sometimes simply about matching peer activity. This defensive rationale was offered by interviewees from 7 companies:

> *"If our peers are doing it then it's likely that we will do it. You're always horizon scanning about what other companies are doing." (Financial service C, interview 1)*

From this defensive perspective, the decision to report is influenced by whether the firm can afford not to participate. More often than not the answer is no because of the reputational risks in being one of few companies not involved. Similar to Stanny and Ely's (2008) study of US companies, the fear of being perceived as a bad corporate citizen or being seen as having something to hide were strong incentives for companies in the sample to continue reporting even when they do not perceive any practical value in doing so.

> *"The other big six energy companies in the UK take part [in CDP's Climate Change Program], so again it would seem strange or wrong to not take part. It would have looked strange if we were the only ones not involved." (Energy utility C, Interview 2)*

Participation at least ensures they are matching the basic activities of peers (Stanny and Ely, 2008; Ihlen, 2009). It is possible to argue that this is evidence of 'reporting to report'. Companies are more concerned about reacting to peers than anything else, and are therefore 'following the herd'. This reflects a similar finding in Ihlen's (2009) study on how climate change is treated rhetorically in the non-financial reports of the world's 30 largest corporations. In particular, Ihlen (2009, p.258) argued companies regardless of their environmental record "will most subscribe to the same types of rhetoric and ideals as its business competitors". While this practice increases engagement with climate change and the amount of available corporate climate information, the emphasis on reporting simply because your peers do raises the question about whether reporting translates into any further action. Ilhen (2009) suggested matching peers is an indication that companies are masking negative environmental practice or performance because they are staying with the herd. Therefore, just because the company reports to the same index as its peers there is no guarantee that they will take action like their peers.

Finally there is evidence to suggest that in some instances carbon reporting is used to explain facts and figure that might otherwise look bad if left unexplained. Where it was once possible to hide embarrassing performance, it is increasingly difficult and complex to do so because companies are now mandated (by the MCR) to disclose emissions data in their Annual report. Carbon reporting, as exemplified by the following interviewee, can be an opportunity for the company to put a more favourable gloss on emissions increases by pointing to factors such as extreme weather that required them to run their systems longer and harder than previous years:

> *"Carbon reporting tells a story even if emissions have gone up. It allows you to explain why they have gone up. If you take the 2012 winter, it was very wet. We had an awful lot of infiltration of surface water into our sewers. We had to pump an awful lot of additional water. That correlated with an increase in energy consumption and GHG emissions. But we were able to show that because we used the data to explain what was going on inside the business before people started asking about why our total emissions had gone up and why their water bills had increased." (Water C, Interview 2)*

This practice strongly implies some kind of greenwashing of information to protect the company's image and navigate potential reputational risks. Voluntary reporting offers a useful avenue for a company to achieve this because they can communicate the gloss on their emissions reduction performance than what is allowed in often restrictive, inhibitive mandatory requirements that collect the bare numerical facts and figures.

A third driver of carbon reporting is regulation. Companies are subject to multiple mandatory requirements (see Chapter 4), the most recent of which, the MCR, came into force just prior to the timing of this study's desktop review and interviews. The conventional organisational response to mandatory requirements like the MCR is to regard compliance as a minimum level of achievement (Jones and Levy, 2007; Kauffman *et al.*, 2012; Gasbarro, 2013). This was strongly iterated in the multi-case study interviews, where 22 of 36 interviewees explained that their company does carbon reporting because they are legally obligated to do so:

> *"First thing, we have to. We are mandated to report on our carbon emissions." (Financial service D, Interview 1)*

Simply put, statutory climate regulation and being required to report is a motivation to do carbon reporting (Carbon Clear, 2014). Even though reporting on climate change (like any form of corporate reporting) is a cost to the company it is accepted as a necessary expense:

> *"Invariably reporting is a cost to the business. In terms of value because it is regulatory driven compliance gives integrity to the company. We've got to do those things so we will do those things. We will play it with a straight bat and deal with the scheme with integrity. We will be compliant." (Water D, Interview 2)*

To do otherwise was unthinkable in an economic regulated sector like Water, where there are important regulatory and reputational risks to appearing as anything other than a compliant, reliable and transparent operating entity.

More generally, all companies have strong incentives to not break the law. Compliance (by reporting) protects a company from regulatory risks such as financial penalties, carbon taxes, and any negative publicity that may arise from being sanctioned for failing to report adequately (Hoffman, 2004; Gouldson and Bebbington, 2007; Eberlein and Matten, 2009; Reid and Toffel, 2009). Indeed, when interviewees were asked about the consequences of failing to comply with a mandatory requirement, it was widely reflected that they would do what was necessary. For example, 11 interview participants noted that it would be very costly if they failed to report their emissions correctly to the EU ETS:

> *"EU ETS has to be reported to the required standards. Have appropriate verification in place and all that sort of thing. We do that because it is a legal requirement. We have to comply with these schemes like any other legally required company because it can be very costly if we fail to do them correctly." (Extractive C, Interview 1)*

Stiff penalties, reputational as much as financial, for failing to do it right, saw all the case-study companies in this study's sample that are subject to the EU ETS treat reporting as just one of those things they've got to do, though others (outside of the study's sample universe) have been fined for non-compliance with EU ETS regulations (European Environment Agency, 2015; Twidale, 2015).

Sanctions for the MCR were not as clear, and accordingly there is more evidence of non-compliance. Five (of 116) companies mandated by the MCR failed to disclose GHG emissions information in their Annual report (see Chapter 5). However, it is not clear if these five companies deliberately ignored the statute or if the absence of emissions data was due to differences in reporting time frames or other factors, as they refused to make themselves available for interview[50]. Interviews with MCR compliant companies suggest that fear of sanction was somewhat less of a factor in driving compliance with MCR requirements than a normative sense of duty and 'responsible corporate citizenship' (see 'Chapter 5').

While ticking the regulatory box may be the stated aim, the process of disclosure can also help firms manage other regulatory demands (Andrew and Cortese, 2011a; 2011b). There is evidence that the emissions data firms are required to collect and report on for the MCR is also used by economic regulated companies in bids to the regulator for capital investment and price increases:

> *"The results of annual and interim carbon and sustainability reporting are used to track progress of schemes designed to reduce our energy use and carbon emissions. They are also used to make cases [to the regulator] for new energy and carbon saving projects that will require additional financial support. We publish reports on the website so that customers, suppliers, students and governing bodies have access." (Water B, Interview 2)*

In order to raise prices, Water companies like this one need to make a case to the regulator. Emissions data helps them justify price increases to fund additional investments needed to reduce emissions and yield other social benefits.

Carbon reporting information is also used by economic regulated companies to defend criticism and avoid blame (Hood, 2002). Energy utility companies in particular are under intense scrutiny to explain why falling wholesale energy costs are not being passed on to UK consumers who have experienced rising energy bills for the last decade. Interviewees from 2 of the 4 case study Energy companies explained that they have used Government climate policy and mandatory schemes as reasons to justify price rises:

[50] Unfortunately the five non-disclosure companies did not make themselves available to talk too, so it is not possible to determine if this is the case or they are exercising their right to withhold sensitive information (see Chapter 4); that their timeframe for mandatory disclosure is later due to their Annual report being published on a different financial year-end date (see Chapter 4) (Carbon Clear, 2014); or when the desktop review was performed the available Annual report was not the latest one.

> *"We communicate that energy prices are going up because we have to do this green obligation stuff that the Government signed up to." (Energy utility B, Interview 2)*

Climate policy and schemes are claimed to have impacted operational costs to such an extent that these costs need to be reflected in bills. Carbon reporting is used as a tool to communicate that energy prices are heavily influenced by conditions which are out of the firm's hands, as well as demonstrating how firms reinvest revenue to reduce emissions and better prepare society for future climate impacts.

Another benefit of complying with reporting requirements is the potential to deflect the implementation of more stringent regulations (Kolk and Levy, 2001; Lyon and Maxwell, 2004; Sullivan, 2008; Eberlein and Matten, 2009; Ihlen, 2009; Gasbarro, 2013). There is evidence that companies participate in voluntary indexes in order to stave off more searching disclosure requirements. For instance, one company's Annual report explained how it was working with Government on climate regulation:

> *"The Group works with industry bodies to engage with governments on public policy, laws, regulations and procedures that impact its business, including on issues such as climate change and energy security." (Antofagasta PLC, 2014b, p.31)*

According to interview participants from 30% of case-study companies engaging with the Government (and regulators) is important because dialogue can encourage policymakers to establish a clear and stable framework that is economically efficient to respond to, and creates information that is useful and usable to the company and its key stakeholders.

> *"We engage with Governments to make sure that the regulations for reporting make sense, so it's not an unjust burden and so forth." (Extractive C, Interview 1)*

This suggests that carbon reporting and wider engagement with climate change is strategically performed to avoid shocks and maintain some degree of control on their future reporting obligation. Carbon reporting then is more than just complying and doing the right thing; it can be utilised to legitimise their activities.

6.3 Practices of Carbon Reporting

The extent of carbon-related disclosure identified in Chapter 5 suggests carbon reporting is a widely performed and well-established corporate practice in the UK business community. Whether in response to a statute or on a voluntary basis, some 92% of companies sampled are doing some form of carbon reporting that looks at their GHG emissions (see Chapter 5). Notably, despite the variety of mandatory requirements and voluntary indexes, generally, these reporting schemes all request similar sets of data (but require it to be presented differently). Specifically all require the disclosure of a) figures for CO_2 emissions, with some also requesting data on some, or all of the six GHGs covered by the Kyoto Protocol; b) a description of any plans or targets introduced to reduce or manage emissions as well as progress towards these targets; and c) information on their climate risks and opportunities, and strategies to cope. Additionally, in terms of the scope of disclosure, all

collect—as defined by the Greenhouse Gas Protocol, which is explained in Chapter 4—Scope 1 (or direct) emissions, with the majority requesting Scope 2 emissions from energy use as well. Only a few mandatory requirements and voluntary indexes request Scope 3 (or indirect) emissions (see Chapter 4).

This similarity in what is reported has encouraged a standardisation to carbon reporting in terms of the things that are counted and the rules for how to count them. Such standardisation is attractive because it enables companies to transfer data from one report to another. However, a notably consequence of this standardisation is that some companies are beginning to be more selective about which voluntary indexes they participate in despite the potential reputational risks associated with not reporting when competitors do. In particular, participation in every single voluntary index is no longer perceived to be good practice because many voluntary indexes collect similar if not the same data, are not necessarily valued by their stakeholders. This builds on corporate concerns where some managers have expressed "some doubts about the value of investing in external disclosure in the absence of an audience (Farnworth, 2007)" (Knox-Hayes and Levy, 2011, p.6). Companies therefore question the added value to their business performance from participating in multiple voluntary indexes when they can report all of the data in what they perceive to be the most credible and useful output:

> *"We no longer do the Dow Jones Sustainability Index, FTSE4Good, or the Corporate Responsibility Index. We only do CDP's Climate Change Program, and undertake the Carbon Trust Standard. A decision was made to only participate in indices we thought were right for the business." (Water D, Interview 1)*

For this interviewee, the decision to report to one index over another is based on the reputational gains and losses from participating in one report over another. Whilst this may be heavily influenced by peer activity, companies are more likely to extend the voluntary reporting they do if they perceive it is relevant or beneficial to business performance. Unless there is a positive impact or it mitigates risks voluntary reporting is perceived to be "'nice to do', but not a 'must do' for those that can 'fly under the radar'" (Stubbs *et al.*, 2013, p.466). Whilst the similarity makes data collection easier it was felt the additional work (e.g., time and money) required to not only participate but perform well was too great. Thus the costs of reporting outweigh the benefits.

Regardless of the frameworks firms were reporting to, responsibility for carbon reporting had to be divided between central reporting units and operational business functions. Although the responsibility for keeping up-to-date, interpreting and responding to mandatory requirements and participating in voluntary indexes typically resides with a central unit (e.g., person or team usually in corporate sustainability or environment function), different operational units or business functions are responsible for physically collecting and submitting data on a monthly basis to the central unit for use. Arguably this approach explains why most interviewees (80%), regardless of their particular

job roles[51] within their firm, were able to comment on their company's carbon reporting practice. This breadth of awareness suggests the practice is well recognised and established, if not necessarily well understood, throughout large firms in Britain.

Despite these broad similarities in reporting lines and processes, the degree of autonomy and responsibility given to business functions varies between energy intensive and non-energy intensive companies. In particular, interview responses indicate there is typically more autonomy in the former than the latter. In energy intensive companies there is typically more autonomy afforded to operational units to exactly determine what and how data is collected and reported. The technical complexities of operational functions mean that only the local function knows what is happening locally:

> *"The quantitative GHG emission data comes from the operations, so refining, marketing, exploration, and production, because they are generating the emissions. They know how and why. This is fed up through an established reporting process to be reported and managed at group level." (Extractive A, Interview 2)*

In this set up, responsibility for data collection is devolved to the various business operations. They are responsible for submitting standardised emissions data and information to a corporate database where the central unit responsible for reporting is able to monitor performance, and then collate information in accordance with the reporting requirements for whatever scheme or voluntary index it is being submitted to. Under this set up the primary task of the central unit responsible for reporting is managerial-based, whereby they finalise the report by adding gloss to material they have received, ensuring it meets the reporting obligation, and checking no commercially sensitive material is included.

By contrast in non-energy intensive companies, what and how data is collected was more typically the responsibility of the central unit responsible for doing the carbon reporting. This central unit determines the content and format for the data to be collected, and then works alongside different business functions, in a hands-on role, to collect the necessary data. As one interviewee reflected about their reporting practice:

> *"We have a project manager who collects data and information from everywhere. We use a materiality matrix process to decide what we should be reporting on. This is made up of information taken from reporting frameworks. Data collection is performed, and we then put that together and report outwards." (Financial service A, Interview 1)*

This approach tended to result in companies sticking to what was required under whatever mandatory requirement or voluntary index they were responding to. Moreover, only a handful of business functions (e.g., real estates and facilities services) are seen to be critical to their carbon

[51] Interviews ranged from individuals—usually people responsible for corporate reporting and sustainability agenda—able to explain intricate details about the practice (e.g., how data is collected, what metrics, which people) to individuals—with no reporting responsibility—able to cite the person or team responsible for reporting but provide no details. These responses combined with the desktop review make it possible to suggest a general practice of carbon reporting, which is outlined below.

reporting because the emissions contribution of most functions (e.g., human resources, compliance, corporate affairs, finance, risk, corporate secretariat) are relatively insignificant and not worth collecting and reporting on separately.

An increasingly important component of carbon reporting practice, whether defined or not, is to have third party assurance for emissions data. Third party assurance is often recommended by mandatory requirements as a sign of good practice (see Chapter 4). The general intention behind attaining this is to give confidence to stakeholders that the included information and associated statements in reports represent a true and fair account of a company's emissions.

> *"Our environmental reporting covers all properties over 10,000 square feet in floor area, which represents 72 per cent of our total footprint. PricewaterhouseCoopers (PwC) provides third-party assurance of our Scope 1 and 2 Greenhouse Gas emissions to ensure the credibility of our data." (Standard Chartered PLC, 2014, p.28)*

Third party assurance is a way for a company to certify that it is undertaking best-practice and making real achievements in reduction.

Beyond external verification of their carbon reports, firms also used other services from external auditors. Several companies went so far as to outsource their carbon reporting to external consultants. In particular, a number of interviewees noted participation in voluntary indexes creates a host of potential regulatory and reputational risks from inadvertently answering questions incorrectly. The often complex and very specific manner in which voluntary indexes phrase questions is unintuitive to the way companies collect and use emissions data:

> *"The problem with CDP is the answers you give them have to be structured in such a way that it becomes a point gathering exercise. You could have the same content and that could have even better transparency and data. But you will lose points if you do not answer in the manner they are expecting you to. That is my biggest beef with CDP. That it is a beauty pageant. It does not reflect your performance and transparency. It reflects your ability to answer questions. So Deloitte helps us with that. The short answer is yes we do get CDP help. We do the content and they review." (Extractive D, Interview 1)*

At the same time, according to four consultants, third party assurance is sought by companies, particularly energy intensive, to protect their reputation from stakeholders who are highly sceptical about their performance:

> *"Assurance helps try and combat the stakeholders' opinion that the company is trying to greenwash." (Consultant B, Interview 1)*

With a credible third party auditing their carbon management practice and the quality of their emissions data, companies can deflect claims that their emission reductions are greenwashed. In this sense third party assurance is all about protecting the company's image, which is a major driver for reporting.

Despite these generalised processes of carbon reporting practice, varying levels of reporting maturity exist between companies in regard to granularity (i.e., scope of disclosure). This difference can be shown by how companies have responded to the MCR. In short, the MCR requires FTSE-

listed companies to submit Scope 1 and 2 emissions data in their Annual report (for more details see Chapter 4). The most mature reporters, found in level 3 disclosure (Chapter 5), include and distinguish Scope 3 emissions data from their suppliers alongside Scope 1 and 2 emissions in their Annual report. In contrast, less mature reporters stuck to what was required, that is, only disclosing Scope 1 and 2 emissions.

Taking into account the rationales for carbon reporting it is possible maturity is affected by a company's perspective about the value of reporting. The most mature reporters may associate carbon reporting with win-win outcomes. By understanding all of the sources of emissions the potential to make savings is greater. At the same time they may receive a reputational benefit. A fuller and/or pre-emptive disclosure can win trust that helps to transform people's thinking (Stanton, 1997; Eccles and DiPiazzo, 2002; Andrew and Cortese, 2011a; 2011b; Matisoff, 2013). By recognising that there are many sources of emissions to cut, a company can come across as sustainable amongst their key stakeholders (Carbon Trust, 2015). For less mature reporters the tendency to disclose in accordance to what is required suggests reporting is about merely ticking a box. Being compliant is something they will always do because of fears over regulatory and reputational risks that can constrain business performance (Gouldson and Bebbington, 2007; Reid and Toffel, 2009). The consequence of box ticking may be to stall innovative thinking for these less mature reporters and prevent them from realising the potential win-win outcomes from tackling all of their emissions. It also means parts of the UK business community may not be taking the necessary step changes society needs to tackle climate change (Sullivan, 2008).

6.4 Impacts of Carbon Reporting

Carbon reporting has raised the public profile of carbon emissions. With the board (or executives) required to sign-off most of the carbon reporting being performed, senior management in charge of business functions have also had to pay closer attention to climate change. Heightened awareness across the company has provided those charged with reporting a reason to approach and consult on a regular basis with business functions that were often unconcerned with social and environmental impacts and sustainability. Carbon reporting, as explained by this individual responsible for reporting, has enabled them to work more closely with the Financial department, the benefit of which has improved the carbon management practice:

> *"There are some benefits in terms of being able to work more closely with the Financial department. They have to engage more with the sustainability team, which is good for us. We have a better in to push our agenda. The statutes have meant sustainability and addressing carbon have become more significant in the managers agenda. More people will be taking it seriously throughout the business." (Financial service E, Interview 1)*

With more parts of the company listening and engaging more deeply with climate change, companies develop a more complete understanding of their carbon emissions and where they can make reductions. This has proven to be particularly helpful for non-energy intensive companies where there is a general indifference to doing anything significant about GHG emissions because of

a belief that their contribution is small and unlikely to be significant for the bottom line ('7.2 Rationales for Carbon Reporting').

As a result the practice of carbon reporting is widely credited by two-thirds of interviewees with initiating the implementation of a range of easy-to-implement climate mitigation measures that include some basic technological and behavioural changes, including:

- Improving energy efficiency and reducing energy consumption in their operations (e.g., streamlining manufacturing processes) and key assets (e.g., improving insulation of company properties);
- Introducing energy management systems for better management of lighting and heating of buildings;
- Replacing outdated, energy-inefficient production installations (e.g., installing high-efficiency electric motors);
- Setting of emission reduction targets for the company and major business functions; an enhanced consideration of climate change in investment decisions;
- Advanced research and investment into energy efficiency, fuel switching and new technology;
- Reducing business travel; and
- Improving employee awareness of the implications of their use of office equipment such as printers and computers for a company's energy consumption.

Carbon reporting is said to be influential in corporate decisions to implement the above measures because the practice of collecting GHG emissions data generates useful and usable information. Through carbon reporting, a company can improve its understanding of own process emissions and supply chain impacts, which helps to identify opportunities to improve business performance. This impact of reporting was highlighted by interviewees and in Annual reports:

> *"By monitoring and reporting on our annual carbon emissions, we can identify areas of the business where energy usage could be reduced, leading to the potential for cost-savings. Furthermore, by improving our buildings to drive energy efficiency we are able to create a better working environment for our people." (Admiral Group plc, 2014, p.21)*

The quantifiability of carbon emissions made it a key performance indicator. Yearly emissions data can be compared to monitor and measure performance of the entire company, business functions, and specific activities. This makes carbon reporting a useful tool to not only inform decisions concerning the application of carbon management initiatives, but also in evaluating the effectiveness of implemented measures to reduce emissions.

> *"From our point of view reporting has been positive. It has helped us monitor our energy consumption a lot more closely, accurately and regularly. It has led to us developing longer-term targets; a five year 17% energy reduction across all of our sites." (Extractive A, Interview 1)*

For this company carbon reporting has led to the development of a five year energy reduction target because it has helped them monitor their energy consumption more closely, accurately and regularly.

In order to drive emissions reductions some companies, particularly in energy intensive sectors, have incorporated data on emissions performance into the structure of their corporate remuneration.

> *"We've got incentives where if we perform well environmentally, where we can prove we are reporting well on our emissions, then we are going to get some cash benefits from it." (Energy utility A, Interview 3)*

Similar remuneration schemes were reported by interviewees from 8 different companies. Employees—either on an individual, team or entire business function basis—are rewarded with bonuses and/or pay rises, if specified emission reduction targets are met or they perform well in voluntary indexes. For instance, when reflecting on their own internal drivers for reporting to CDP's Climate Change Program this interviewee, from a service-based company, reflected some of their competitors have a key performance indicator for those responsible for reporting to come within the top percentile of companies.

> *"Some of our competitors have people in my position with a key performance indicator [for remuneration] to come within the top percentile of CDP's league table." (Financial service A, Interview 1)*

Such an activity raises an interesting question about the internal processes and approaches for collecting and producing data for reporting, and what is communicated publicly. More simply, with particular regard to the internal negotiations about what the data is actually saying, what it could say, and how to represent the data. All these accounts mix reporting with more legitimate corporate activities with the primary purpose to maintain business growth (Nyberg and Wright, 2012).

However, while reporting is credited with these internal organisational changes, interview participants and the desktop review raise the question of whether efforts to reduce emissions and improve energy efficiency can be attributed to reporting per se or to wider underlying economic, reputational and regulatory drivers. Evidence indicates that emission reduction by energy intensive companies in particular is driven primarily by financial considerations rather than reputational ones. For these firms reducing emissions reduces their costs. They tended to regard the EU ETS mandatory requirement as a 'pure carbon tax'. This is because the EU ETS not only directs companies to submit emissions data, but also makes it necessary for participants to buy allowances for every tonne of carbon emitted (as reported under the scheme). This creates a reputational risk that influences decisions to reduce emissions more so than reporting. Interviews with 8 individuals responsible for reporting indicate emissions reductions are strongly influenced by a company desire to cut carbon penalties and taxes, as explained:

> *"We were going to be taxed on top of our existing energy bill so there was an incentive to actually reduce energy consumption and emissions to reduce the unjust tax." (Energy utility C, Interview 2)*

While this company (and others) link the quantifiable transparency of their emissions to decisions to act, it is clear that it is the emission cap and associated 'cap and trade' requirements rather than the reporting requirement per se that is driving this firm's efforts to reduce emissions. By implementing energy efficient measures companies can reduce the carbon taxes they have to pay and thus positively affect their financial performance and reputation since they are emitting less emissions (Hoffman, 2004). Indeed, as BG Group plc in their Sustainability report noted, meeting their GHG emission reduction targets through energy efficiency had lowered their emissions and carbon taxes paid:

> *"Meeting them [GHG emission reduction targets] can also bring financial benefits. Gas or oil saved through improved efficiency can be sold, while lower emissions also mean lower costs from carbon taxes or emissions trading schemes." (BG Group plc, 2014, p.37)*

Additionally, as noted by other studies (Kolk and Pinkse, 2004; Hoffman, 2005; Lash and Wellington, 2007; Wittneben and Kiyar, 2009), other companies, more typically non-energy intensive firms, are incentivised to act by potential reputational benefits:

> *"Energy reduction is more about having the targets to talk about externally than any internal cost-savings. More savings can be made from re-negotiating your energy supply than actually reducing energy." (Financial service C, Interview 1)*

In this instance, the company's primary purpose for reducing their energy consumption is not saving money but having a positive story to project externally. Having a good story on their emissions is important because of stakeholder pressure on companies to show evidence of emission reductions.

Under a similar intent, such reputational considerations drive companies to think strategically about what and how they report. In particular, there is evidence that some companies began to attain third party assurance and accreditation (e.g,. Carbon Trust Standard[52]) in order to be ranked more favourably in voluntary indexes:

> *"We went for the Carbon Trust Standard because we wanted external validation for our improvements in management of carbon emissions reductions. This was partly driven by the fact that if you have the Carbon Trust Standard or an equivalent scheme you would get bonus points. This was good because you would go up the league table." (Water A, Interview 1)*

Companies are so eager to perform well in voluntary indexes because being ranked in the top percentile of participants in their sector and the business community more generally can generate big reputational gains that led to business growth (Mastioff *et al.*, 2013). This raises an interesting question about the potential abuse of third party verification and voluntary indexes, and their ability to actually drive emission reductions (Kim and Lyon, 2011; Matisoff, 2012; Cho and Patten, 2013).

[52] Carbon Trust Standard provides independent verification and certification services that help organisations reduce their carbon emissions and become more resource efficient. It aims to enhance corporate reputation and build trust with customers, investors and stakeholders.

With corporate remuneration linked to performance, employees want to perform well in voluntary index league tables since the better they do the bigger their bonuses. As companies seek to outperform peers the desire to cover up negative performance or do some clever accounting to paint a more positive image must be tempting (Greer and Bruno, 1996; Lyon and Maxwell, 2007; Matisoff, 2012; 2015).

Moreover, the impact of carbon reporting on organisational culture and behaviour can be further questioned by the strong evidence that diminishing returns have set in. Whereas carbon reporting was initially effective in driving improvements and emission reductions it appears to have less of an impact now. There are signs of some kind of corporate reporting fatigue, an issue Brown *et al.* (2009b) noted about companies participating in GRI's sustainability reporting network (see Chapter 2). Whilst not explicitly evident in public disclosures (from the desktop review) it is clear from speaking with those responsible for reporting that 80% of case-study companies are beginning to question the value of all the carbon reporting they have to do.

> *"The problem I have with all of the carbon reporting is it is a set of figures which are actually meaningless in isolation. If you look at our target performance over the last ten years at the beginning we made a lot more progress than we do now. If someone picks up our report last year then they would think we have done nothing. They often completely ignore the amount of effort that has been done before. It is a set of figures that when compared to another set of figures is quite meaningless if I am honest. Moreover, the reporting parameters change so much between requirements that it does not give a full picture of what is going on across the world or even the UK in terms of carbon performance." (Financial service D, Interview 1)*

This question of its value is particularly apparent in regard to the latest mandatory requirement companies are faced with, the MCR. Interview participants were asked to express how their company was responding to the MCR. More than two-thirds of interviewees involved in corporate reporting replied that the MCR had made a negligible impact on their approach to reporting or wider corporate decision-making. For them the problem resided in the MCR's perceived similarity to other mandatory requirements they do:

> *"It [the MCR] doesn't look like there is anything in there that we don't do already. We have been gathering all of the information to do it. It is just the potential additional cost of the extra level of verification required." (Extractive A, Interview 1)*

As the interviewee remarked, the MCR does not require any data outside of their existing corporate carbon reporting practice; it simply requires a different reporting format and output (i.e., disclosed in the Annual report). The normal corporate response to the requirement is to transfer data from other carbon reporting requirements and rewrite the associated textual description. As a result, many argued that the MCR has made little impact on their organisational culture and behaviour. In this instance the MCR can be argued to be an example of reporting for the sake it. The chief benefit reporting appears to provide is avoiding the regulatory risk of non-compliance (Gouldson and Bebbington, 2007; Reid and Toffel, 2009).

The fact the MCR has made little impact on organisational culture and behaviour has repercussions for the Government's nudge-based strategy for governing climate change (see

Chapter 4). Firstly, it would indicate that nudging companies to engage with contemporary environmental and social issues is not a universally effective strategy. A one-size-fits-all approach to climate regulation is difficult because some companies may ignore statutes to report if non-compliance brings no dire consequences—at the very worst companies will be made to report again if they do not comply with the MCR (for more details see Chapter 4). This suggests legal requirements are important, but they are not all-powerful and reinforces wider concerns in the literature about the limits of nudge-based approaches to initiate attitudes and behaviour change through regulation (John *et al.*, 2009; Shove, 2010; Marteau *et al.*, 2011; Goodwin, 2012).

6.5 Discussion

Carbon reporting is a widely performed corporate practice. 92% of 176 companies sampled do some kind of reporting. There rationales for reporting are principally attached to financial reasoning, social pressures, and regulatory compulsion. In particular, firstly, companies are motivated by the potential win-win outcomes from reporting. Carbon reporting identifies, measures, and monitors emissions. Emission levels are primarily affected by energy consumption. Reporting can indicate where energy efficiencies can be made that will not only reduce emissions but also led to economic savings. For energy intensive companies this is a strong rationale for reporting. They can receive a substantial economic return because their scope for reducing energy consumption, which is a large contributor to their net expenditure, is the broadest. Secondly, companies are motivated to report by legitimacy-seeking desire. As social pressure for more aggressive emission reduction strategies mounts, carbon reporting is an opportunity for companies to demonstrate they are taking steps to reduce their emissions. Communicating such information is an invaluable tool to manage—defend and/or enhance—their reputation with stakeholders. Notably, based on energy intensity, different companies see different reputational management opportunities. For energy intensive companies carbon reporting is done with the aim to protect their social licence to operate because of their environmental and carbon footprint. For non-energy intensive companies carbon reporting, particularly the voluntary kind, is done with the aim to gain a competitive advantage, as well as meet the minimum corporate climate change standards. Thirdly, companies are motivated to report because they have to. All companies are subject to some form of statutory obligation to do carbon reporting, with economic regulated companies (particularly Water) also required by their regulator to include emissions data in their business strategy. By reporting a company ensures they do not break the law, which helps them avoid financial penalties. Whilst companies do carbon reporting because they have to, there is a whole load of voluntary reporting. Different types of companies have different motivations. For energy intensive companies voluntary carbon reporting is done with the aim to help avoid more stringent regulation. Whilst for economic regulated companies voluntary carbon reporting is done with the aim to support cases to the regulator for investment and price rises.

Despite these different rationales for reporting there is a standardisation to data collection. This has occurred because standardisation enables companies to easily transfer data between the

multiple forms of mandatory and voluntary reporting firms do. The responsibility of reporting is divided between central reporting units and operational business functions, whereby the former keeps up-to-date with regulation and supplies this information to the latter which collect, interpret and write the data ready for reporting. Notably, there is evidence highlighting a difference between the degree of autonomy and responsibility given to these two functions in energy intensive and non-energy intensive companies. In energy intensive companies the central unit's role is managerial. They are less involved in data collection with their responsibility to provide regulatory information, add gloss to the final reports, and ensure the requirements of reporting are met. In non-energy intensive companies the central unit's role is hands-on. They are more involved in data collection, often setting and requesting what and how data is collected, as well as interpreting it for reporting.

Due to this standardisation in reporting and the three drivers of reporting—financial reasoning, social pressure, and regulation—companies widely associate reporting with a range of easy-to-implement climate mitigation measures that include basic technological and behavioural changes to the organisational culture and behaviour. This has been possible because the board is required to sign off most of the reporting performed. Under this spectre engagement in emission reductions is more fluid across a company. This is supported by the fact that carbon reporting is extremely business friendly. Emissions data is quantifiable. Companies are not only able to identify, monitor, and manage emissions performance but they are also familiar with the data. This makes it easier to sell to different operational business functions. Yet evidence questions whether efforts to reduce emissions and improve energy efficiency are down to reporting per se to wider economic, reputational and regulatory drivers. Specifically, for energy intensive companies, which are driven by financial considerations rather than reputational actions, their desire to reduce their costs in energy and carbon taxes and minimise potential regulatory penalties has seen them incorporate emissions performance into the structure of their corporate remuneration. In a similar questioning manner, non-energy intensive companies, which are driven by reputational reasons, appear to reduce emissions in order to have some positive stories to project externally to satisfy stakeholder demand. What's more, there is evidence that diminishing returns have set in. All types of companies openly questioning the value of all reporting they have to do, especially in regard to the MCR (the latest mandatory requirement) because it is so much like the others. Thus carbon reporting and emissions reductions can be seen as a strategic practice.

Reading across the components of reporting—rationales, practices and impacts—there is a difference between energy intensive and non-energy intensive companies. Energy intensive companies tend to be ecological modernists in their rationales for reporting because they can make the greatest changes and the biggest savings. While they can make big changes their true motivation appears to be attached to lowering carbon taxes. Due to their energy intensity the best way to make continuous changes was to give the responsibility to the operational business functions who have local knowledge and expertise. Thus they are incentivised through bonus pay to continuously work towards cutting emissions. By contrast non-energy intensive companies do not make big financial savings from reducing emissions and energy because of the nature of their business. Instead they

can make reputational gains and develop market differentiation from being proactive and performing more favourably in voluntary indexes than competitors.

There also appears to be a difference between economic regulated and non-economic regulated companies. Some economic regulated companies, particularly Water companies have an additional statutory obligation to provide their regulator Ofwat with emissions data. Thus for these economic regulated companies they have had to meaningfully engage with carbon reporting and action. For other economic regulated companies carbon reporting is about managing their relationship with the regulator and customers because of their consumer facing nature. In particular, reporting is used in bids for capital investment and justifying price increases. By contrast, non-economic regulated companies typically report to enhance their reputation rather than defend it. They are not required to disclose or include emissions data in their business strategy. If they do so they might be able to develop a market differentiation that attracts socially and environmentally conscious investors.

Given the apparent importance of these two corporate characteristics, energy intensity and economic regulation, in affecting carbon reporting it is possible to create a two-by-two table (Figure 6-1) that predicts four broad categories of carbon reporting response in the UK business community.

	Energy intensive	**Non-energy intensive**
Economic regulated	*Category A* Being compliant and legitimacy-seeking e.g., reducing emissions will alleviate concerns, and help support cases to the regulator for capital investment and pricing changes.	*Category D* Being compliant and auditable e.g., reducing emissions will be good for profile (as low contribution), and help manage their relationships with investors and the regulator.
Non-economic regulated	*Category B* Eco-modernist e.g., reduce emissions because big savings can be made from energy efficiency, and less carbon taxes to pay.	*Category C* Legitimacy-seeking e.g., reducing emissions to move up league tables, but reductions are restricted by what they can feasibly change.

Figure 6-1: Sector characteristics that affect corporate carbon responses

Companies falling into Category A are energy intensive and economic regulated (Figure 6-1). It can be anticipated that carbon reporting for these firms is about being compliant and legitimacy-seeking. They need to manage their relationship with the regulator by being compliant as failure to do so can result in performance restrictions. At the same time, these companies use reporting to positively affect their relationship with the regulator by demonstrating how they are reducing emissions to make cases for changing their business strategy. Moreover, these companies also face

significant reputational risks because of their consumer facing positionality. Reducing emissions will alleviate some of the social pressures they face. Alongside case-study sectors Energy utility and Water, the Transport sector is likely to fall into this category. Transport companies are economically regulated, and relatively energy intensive because of their reliance on fuel and high emissions contribution. Therefore, like Energy utility and Water companies, Transport companies need to manage their relationships with its regulator, potential investors, and customers in order to navigate potential negativity over changing costs in their service, and emissions increases from business growth.

Companies falling into Category B are energy intensive and non-economic regulated (Figure 6-1). It can be anticipated that carbon reporting for these firms mostly resembles an eco-modernist perspective. Reporting is about economic savings from reducing their energy consumption and carbon taxes. Once they have achieved these they can then use it to create some market differentiation, which will both be a win-win outcome and protect their reputation. Therefore, the impact of carbon reporting on organisational culture and behaviour depends on whether the measure is perceived to be economically feasible and likely to produce a win-win outcome for the company. Alongside case-study sector Extractive, the Industrial, and Consumer staple sectors are likely to fall into this category. Both sectors are energy intensive but not economically regulated. Reducing emissions and energy consumption in their production line can lead to significant cost savings and a reduction in carbon taxes.

Companies falling into Category C are non-energy intensive and non-economic regulated (Figure 6-1). It can be anticipated that carbon reporting for these firms is most likely to include elements of greenwashing. Due to their non-energy intensive nature they cannot make big savings from reducing energy consumption. However, reporting is important, especially to voluntary indexes because it is a way for them to develop market differentiation, which is increasingly important in getting new business. Therefore, decisions to report and act are influenced by the scope of reputational gains. Having a credible and respected corporate image is particularly important for these companies because they rely on the strength of their reputation to persuade the growing population of socially and environmentally conscious stakeholders to invest or purchase their services. Alongside case-study sector Financial service, the Consumer discretionary, Healthcare, and Information technology sectors are likely to fall into this category. All of these sectors are not economically regulated, and are less energy intensive in comparison to other sectors. Reducing emissions and energy consumption is unlikely to be primarily driven by cost savings—even though a case can be made that Consumer discretionary, and Healthcare sectors can make notable energy efficiency improvements in production—instead actions are about gaining market differentiation.

Companies falling into Category D are non-energy intensive and economic regulated (Figure 6-1). It can be anticipated that carbon reporting for these firms is about demonstrating their compliance and being auditable. Although they cannot make big financial savings from reducing energy and emissions, reporting is an important tool to manage their relationship with the regulator

who can restrict their business growth. If companies do decided to publicly reflect on the amount of economic savings they are making from emission reductions it is possible to view this narrative as greenwash because they can't really make a big saving. While no case-study sectors fall into this category, the Telecommunication sector is most likely to. Telecommunication companies are economically regulated, and non-energy intensive in comparison to other sampled sectors. Reducing energy and emissions is not likely to yield significant financial benefits, but carbon reporting will help manage their relationship with the regulator.

Whilst the four broad categories in Figure 6-1 provide a useful classification of UK-based corporate carbon responses, it overlooks how specific resources and capabilities[53] of a firm also drive business strategy and performance alongside the more general sectoral characteristics identified in this study (e.g., energy intensity, and economic regulation) (Barney, 1991). Firm specific characteristics empirically identified as causing variability in corporate environmental strategy (Berry and Rondinelli, 1998; Sharma and Vrendenberg, 1998; Aragon-Correa and Sharma, 2003; Branco and Rodrigues, 2006; González-Benito and González-Benito, 2006; Hahn and Kühnen, 2013; Muttakin *et al.*, 2015) and corporate climate change strategy (Bansal, 2005; Wahyuni and Ratnatunga, 2014; Amran *et al.*, 2015) include: corporate size; internationalisation; financial performance (e.g., liquidity or profitability); managerial attitude; managerial international experience; strategic direction and attitude; ownership structure; board diversity; and position in the value chain, among others.

For example, both 'financial performance' (measured by market returns, return on assets, or return on equity) and 'managerial attitude' (measured by the level of management support, commitment, and knowledge for an issue) affect (albeit in slightly different ways) how firms identify and manage environmental issues. Specifically, it is assumed that the stronger a firm's financial performance is the likelier they are to take action and/or disclose information because profitability increases their ability and flexibility to bear the costs of implementing actions and/or cope with the consequences of disclosing sensitive information (Branco and Rodrigues, 2006; Hahn and Kühnen, 2013; Muttakin *et al.*, 2015). In regard to managerial attitude it is assumed that a firm with a supportive, committed and knowledgeable board and senior management is likelier to take action and/or disclose information because managerial endorsement increases access to essential resources necessary for implementation (e.g., financial, technological, strategic, etc.) and/or the extent of cross-organisational engagement and collaboration (Berry and Rondinelli, 1998; Branco and Rodrigues, 2006; González-Benito and González-Benito, 2006; Hahn and Kühnen, 2013).

Given the significant influence of firm specific characteristics (as demonstrated by these two examples) on environmental and climate change strategies it is probable that they will also affect the four broad categories of carbon reporting response. That is, firm specific characteristics such as financial performance and managerial attitude are predicted to cause variability between the carbon

[53] According to Galbreath (2005) a firm's resources can be defined as owned and controlled by the organisation, whereas capabilities are defined as an organisation's capacity to undertake an activity or to deploy resources to create market differentiation.

reporting responses of companies classified in the same category of Figure 6-1. Despite (this study) not collecting any specific empirical data on firm specific characteristics it is possible to hypothesise how financial performance and managerial attitude could affect each category of carbon reporting response (illustrated in Figure 6-1) by applying the abovementioned assumptions and empirical findings about their influence on corporate environmental and climate change strategies. Through this process the following affects are hypothesised.

For Category A companies—energy intensive and economic regulated—carbon reporting is about compliance and/or legitimacy-seeking (Figure 6-1). Financial performance and managerial attitude are likely to affect whether a firm chooses to go beyond the economic regulator's standards. Strong financial performance gives a firm the option to take innovative and aggressive emission reduction measures because they have the financial capacity to. Implementing such measures (regardless of success) will enhance their reputation because kudos is attached to actions that demonstrate (or at least appear to) meaningful commitment to tackling emissions. Similarly, supportive management empowers individuals' responsible for carbon reporting to take stronger measures. The benefit in both instances will be a strengthen of their relationships with key stakeholder (e.g., economic regulator) and potentially developing market differentiation. By contrast, weak financial performance or unsupportive management is likely to prevent firms from taking expansive measures that go beyond the minimum requirements necessary for satisfying regulatory demands and matching the standards of competitors. Unsupportive management may deter individuals responsible for carbon reporting to act innovatively by restricting access to essential resources. This narrower capacity reduces the chances of a firm taking actions that will enhance their reputation. Therefore, carbon reporting responses in firms with weak financial performance or unsupportive management will be about ensuring compliance.

For Category B companies—energy intensive and non-economic regulated—carbon reporting is about eco-modernism (Figure 6-1). Financial performance and managerial attitude are likely to affect whether a firm's actions to reduce emissions (to make economic savings) are 'hard' or 'soft' measures. Firms with strong financial performance or supportive management have a better opportunity to implement hard measures because they have the financial capacity and managerial endorsement to support costly action. Implementing hard measures will enhance their reputation and develop market differentiation. As a result, alongside the eco-modernist mindset of economic savings these firms may partly perceive carbon reporting as a legitimacy-seeking exercise. By contrast, firms with weak financial performance or unsupportive management are more likely to stick with soft measures that lead to economic savings at a low expenditure to the company. Therefore, carbon reporting is more about matching competitors' actions.

For Category C companies—non-energy intensive and non-economic regulated—carbon reporting is about legitimacy-seeking (Figure 6-1). Financial performance and managerial attitude are likely to affect whether a firm uses carbon reporting to enhance or defend their reputation. Firms with strong financial performance or supportive management are more likely to invest in innovative measures (and report voluntarily) that may enhance their reputation. By contrast, firms

with weak financial performance or unsupportive management are unlikely to take risks on measures that could lead to competitive advantages because they lack the capacity to cope with failure. Therefore, carbon reporting is likely to be about defending and maintaining their reputation, whereby implemented measures aim to match competitor standards.

For Category D companies—non-energy intensive and economic regulated—carbon reporting is about being compliant and/or auditable (Figure 6-1). Financial performance and managerial attitude is likely to affect whether firms go beyond the economic regulator's standards. Firms with strong financial performance have the financial capacity to do more than required, such as participate in voluntary reporting indexes alongside mandatory reporting. Similarly, supportive management is more likely to encourage pro-activeness and engagement beyond regulation. The potential benefit of such actions is an improved relationship with their economic regulator, which may in turn help prevent more stringent forms of regulation being implemented. By contrast firms with weak financial performance or unsupportive management are likely to do what is required to ensure they comply with the regulator and statutes. There is little financial capacity and managerial support to invest in innovative emission reduction measures that might enhance their reputation.

6.6 Conclusions

Getting companies to participate in carbon reporting is assumed to lead to an enhanced application of climate mitigation measures. This assumption is based on an argument that behavioural change will occur because reporting will encourage companies to develop a deeper understanding of an issue or topic, while being forced to disclose their performance publicly will incentivise them to take steps to improve that performance (Hoffman, 2004; Pfeifer and Sullivan, 2008; Sullivan, 2008; Eberlein and Matten, 2009).

This study found that while carbon reporting is coupled to changes in internal organisational dynamics (e.g., developing internal reporting practices, raising awareness of GHG emissions, changing corporate remuneration policy to reflect emissions performance) and emission reductions it is not the primary influence on decisions to act. Instead a set of inherent economic, reputational, and regulatory factors are more influential in corporate decision-making processes for carbon reporting and climate mitigation. That is, carbon reporting is only able to influence organisational behaviours towards climate change when there are other strong economic, reputational or regulatory pressures for action.

Without those other incentives the evidence suggests companies are unlikely to take much action beyond merely reporting. The MCR is a case in point. For the moment at least, this new mandatory reporting requirement does not appear to have driven much additional mitigation action. Many firms were already reporting to various mandatory and voluntary schemes. These firms already had important financial or reputational incentives to act. The additional MCR requirement did not provide much additional impetus for action. Firms not already facing stakeholder pressure to participate in voluntary reporting do not seem to have been moved by the

MCR to do anything more than report. Indeed, since the penalties for non-compliance with the MCR are weak, some firms refused even to participate in the MCR. This suggests that mandatory reporting requirements are not really an effective nudge of emission reduction. It suggests that if you want to drive emissions you have got to make it pay either financially, reputationally, or both. Otherwise the tendency is for reporting to become an end in itself that is decoupled from everyday business practice.

Chapter 7 Corporate Adaptation Reporting: Rationales, Practices, and Impacts

7.1 Introduction

The UK Government's vision is to ensure all "UK businesses are resilient to extreme weather and prepared for future risks and opportunities from climate change" (HM Government, 2013, p.82). Findings of Chapter 5 suggest there is considerable work to do as only a minority (29%) of 176 leading UK companies—whose Annual report, website, and other corporate documents were reviewed—explicitly mention any engagement with climate adaptation. Yet if the example of carbon reporting is anything to go by the relationship between adaptation reporting and organisational culture and behaviour is complex. A number of economic, reputational or regulatory pressures influence decisions to act, and to report on those actions. While reporting requirements can, in certain contexts, be an important driver of action, Chapter 5 noted how confidentiality concerns may inhibit companies from publicly disclosing adaptation information. For all these reasons, the frequency and volume of adaptation reporting is not necessarily a true reflection of whether, how, and why companies may be adapting to climate change.

Therefore, this chapter, in the same style as the previous chapter on carbon reporting[54], utilises the three broad organisational reporting perspectives presented in Chapter 2—ecological modernisation, greenwashing, and audit culture—to analyse the organisational rationales for, practices of, and responses to adaptation reporting.

This chapter is divided into four sections. Section one reviews the rationales for adaptation reporting and distils several widely observable drivers for adaptation disclosures. Section two then describes the processes and practices of adaptation reporting, and discusses how they vary across the sample. Section three assesses the impacts of adaptation reporting on corporate support for adaptation, and whether adaptation reporting is coupled to the implementation of strategies for improving adaptive capacity and climate resilience. This then leads to a fourth discussion section that draws together findings from the three previous sections—rationales, approaches and impacts—to consider sectoral and other differences in whether, how and why adaptation reporting affects business performance. The chapter ends by summarising the main points, and argues adaptation reporting is a technical corporate practice.

[54] The chapter draws upon the desktop review of Annual reports, corporate websites, and other corporate documents of 176 leading UK-registered companies; 36 interviews with individuals working for a purposeful sample of companies in the case-study sectors (e.g., Energy utility, Extractive, Financial service, and Water); as well as a further 24 third party conversations with Government officials, Regulators, Consultants, and Independent body organisations (see Chapter 3 for further details on data and methods).

7.2 Rationales for Adaptation Reporting

In a sample of 176 companies only 50 reference the term 'climate change adaptation', and even fewer (29 of 176) provide any evidence that they are doing specific adaptation reporting (see Chapter 5). Given that the majority of companies sampled (126 of 176) do not report, it is important to discuss their rationales for not reporting. To do that 36 interviews with key informants from 19 case-study companies (that either report or do not report[55]) is drawn upon. Interview data point to a number of possible reasons for the lack of adaptation reporting.

Firstly, the lack of adaptation reporting may be due to limitations in knowledge about their potential climate impacts. Some companies do not report because they are unsure about what they need to adapt to. This is partly caused by the fact that climate change and the climate science produced to ostensibly inform society's actions is characterised by a 'cascade of uncertainty' (Schneider, 1983; Wilby and Dessai, 2010) about the timing and scope of climate impacts, ecological-physical interactions, and the socio-economic and demographic pathway society will take (Schneider and Kuntz-Duriseti, 2002; Peterson, 2006; Dessai *et al.*, 2007; Lempert and Groves, 2010; Linnenluecke *et al.*, 2011; Linnenluecke and Griffiths, 2012; Bierbaum *et al.*, 2013; Linnenluecke *et al.*, 2013). These uncertainties that plague projections of climate change and its consequences affect the degree of confidence users have in its ability to reliable inform decisions. Indeed, as explained by this interviewee that used UKCP09 (for more details see Chapter 4) to inform their adaptation reporting[56], the uncertainty in UKCP09's science makes them question the robustness of data to base decisions for localised issues (cf. Tang and Dessai 2012):

> *"There is a lot of uncertainty with UKCP09's science. It used 25km square grids. When climate models talk about regional modelling they are talking about several hundred kilometres. Getting down to that level of granularity carries massive uncertainty. Also you cannot make very specific plans to deal with any of it. It was broadly useful in terms of highlighting the issue and in some ways pulled out some weather issues we might have missed. But I don't think the climate science is robust enough at that level. It can show me potential impacts but the extent is uncertain." (Energy utility C, Interview 1)*

This uncertainty is a major red light for corporate business organisations that are inherently risk adverse and tend to rely on the comprehensiveness, robustness, and trustworthiness of information to support their evidence-based approach to decision-making (Demeritt and Langdon, 2004; Sarewitz, 2004; Dessai *et al.*, 2005; Lemos and Morehouse, 2005; McNie, 2007; Sarewitz and Pielke, 2007; Gawith *et al.*, 2009; Arnell, 2011; Dilling and Lemos, 2011; Tang and Dessai, 2012). Faced with such uncertainty companies often take a no or low risk adaptation approach even if they identify additional risks and opportunities (Berkhout *et al.*, 2006). It is therefore possible that uncertainty may also put companies off reporting altogether because they cannot interpret the science into something meaningful for business performance.

[55] Of 19 case-study companies sampled 13 do some adaptation reporting and 6 do not report.
[56] UKCP09 aims to enable users to determine what economically, socially and environmentally sensible investments they can make for low, medium and high risk weather events and climate change (Hulme and Dessai, 2008a; 2008b; Jenkins et al., 2009; UKCIP, 2011).

Secondly, the lack of adaptation reporting may be due to the fact that climate adaptation is shrouded in negativity. For a long time climate adaptation was seen as a bad news story because of its initial policy framing as 'negative thinking'. Historically advocates for adaptation were assumed to lack commitment to addressing the causes of the problem, marking them as both an irresponsible and unethical entity (Füseel and Klein, 2006; Pielke Jr *et al.*, 2007; Hultman *et al.*, 2010; Preston *et al.*, 2011; Kahn and Timmons Roberts, 2013). Due to this deep ingrained perception it is possible that many companies remain cautious about the reaction of its stakeholders if they talk about climate adaptation on equal terms to climate mitigation. This may put companies off adaptation reporting because of fears over it being poorly received by stakeholders unfamiliar with the value of doing climate adaptation.

Thirdly, the lack of adaptation reporting may be due to the often commercially sensitive nature of climate adaptation (Baglee *et al.*, 2012). Adaptation reporting involves identifying and publicly disclosing a company's weaknesses both to potential competitors and to other stakeholders whose responses to that information may significantly affect business performance. Communicating this information clearly and in positive terms can be difficult, and the potential for key stakeholders to misinterpret information about climate risks and responses to them is considerable. This makes adaptation reporting a somewhat risky practice. As Agrawala *et al.* (2011, p10) noted, "there is little incentive for companies to identify and publicise the work they are doing on adaptation. Many of the benefits are private and the messages sometimes complex, which give it less potential as a source of positive publicity than action on mitigation." Indeed, 5 interviewees from companies doing adaptation reporting (in response to the ARP) noted information deemed sensitive for business performance was left undisclosed. For example, one commented:

> *"The report was slimmed down because we wanted to keep certain confidential information out of the public domain. We couldn't tell them everything." (Water C, Interview 2)*

Legitimate concerns about commercial confidentiality inevitably result in selective disclosures and the withholding of negative information. Thus even mandated adaptation reporting is susceptible to greenwashing. This may be further compounded by a company's fear that their stakeholders lack expertise or knowledge for climate adaptation (and their full portfolio of activities), which may cause misinterpretation or an interpretation they want to avoid (Poleza, 2005; Lyon and Maxwell, 2011).

Fourthly, the lack of adaptation reporting may be due to the intrinsic difficultly of accounting for climate risks and adaptation to them. As expressed by this interviewee and 5 others, unlike the emissions data that underpins carbon reporting, adaptation does not lend itself to being quantified in ways that fit easily with traditional accounting principles:

> *"It is intrinsically less aggregative and we don't need to report. Adaptation data doesn't lend itself to the same data and quantitative reporting as carbon emissions, which also have a standardised way of doing things. There is nothing in that space for adaptation." (Extractive B, Interview 1)*

This difficulty in aggregating and quantifying adaptation information means reporting is sometimes seen as burdensome.

Fifthly, corporate adaptation reporting is very similar to risk management practices (Berkhout *et al.*, 2006; Hultman *et al.*, 2010; Weinhofer and Busch, 2013; Wise *et al.*, 2014; Gasbarro and Pinkse, 2015). That is adaptation reporting often comprises the three risk management stages of identification, assessment, and response. This similarity may explain why most companies sampled (126 of 176) do not report on adaptation per se because they fail to recognise climate adaptation as a discrete activity separate from their normal business continuity planning (Bloom and Menefee, 1994; Gouldson and Bebbington, 2007; Agrawala *et al.*, 2011; Berrang-Ford *et al.*, 2011; Baglee *et al.*, 2012; CDP, 2012; Bierbaum *et al.*, 2013; Crawford and Seidel, 2013; Averchenkova *et al.*, 2015; Pauw, 2015). For example, one informant talked about identifying their climate risks and putting them in their risk register:

> *"Major projects are required to screen for potential impacts of extreme weather under climate change. If any risks are identified they are entered into the risk register and managed like any other risk. That's how we are attempting to manage the physical impacts of climate change. For example, an offshore platform is already designed to withstand all the storms and wave heights in current climatic conditions. We ask them to make sure they carry on with existing risk management protocols, but factor in anything on top for the consequences of future climate change." (Extractive A, Interview 2)*

Companies, particularly environmentally sensitive firms, are so familiar with managing weather-related risks and opportunities (e.g., protecting infrastructure from flooding) they do not perceive adaptation to climate change as something that should stand apart from existing practices (i.e., environmental risk assessments) and be reported on separately.

Sixthly, the lack of adaptation reporting may be due to the fact that relatively few companies are required to do so. There is no equivalent for adaptation to the various voluntary schemes for reporting on carbon emissions; and just 36% of the sample (64 of 176), all critical infrastructure providers (e.g., Energy utility, Transport, and Water companies), were subject to the ARP requirement to generate a specific (standalone) adaptation plan detailing climate risks and opportunities, and how the firm planned to respond (for more details see Chapter 4). In the absence of a statutory driver there is strong evidence that companies are less likely to do adaptation reporting. Most of the sampled companies[57] (35 of 50) publicly disclosing adaptation information were subject to the ARP's first round of reporting. The remaining 15 (of 50) non-mandated companies[58] publicly disclosing adaptation information did not point towards a regulatory compulsion to report. Indeed most non-mandated companies were unfamiliar with the ARP. All 17

[57] The sectoral breakdown of the 35 firms mandated to report to the ARP's first round of reporting that disclose adaptation information is 13 Energy utility, 7 Transport, and 15 Water companies.
[58] The sectoral breakdown of the 15 firms not subject to the ARP's first round of reporting that disclose adaptation information is 2 Consumer discretionary, 2 Consumer staple, 6 Extractive, 4 Financial service, and 1 Telecommunication companies.

interviewees from the 11 (of 19[59]) case-study companies not mandated to report professed ignorance about the ARP, for example:

> *"This hasn't come to my attention yet, so thank you for raising it [laughter]. I will have to look into this more." (Extractive A, Interview 2)*

The fact this interviewee (who is responsible for their company's climate reporting) had not heard of the ARP suggests that without a mandatory requirement companies are less motivated to engage in adaptation reporting.

Indeed, a first major driver for adaptation reporting identified by reporting firms is the legal obligation to do so:

> *"It [adaptation reporting] was something we had to do." (Water B, Interview 1)*

Other interviewees from the 8 case-study companies mandated to report in the ARP's first round of reporting[60] consistently identified the statutory obligation as a rationale for reporting. In fact all of the adaptation plans submitted to the ARP's first round included a statement like this one to the effect that the report was prepared to comply with the direction:

> *"Portsmouth Water has prepared this report to comply with the direction issued by the Secretary of State to Portsmouth Water under Section 62(1) of the Climate Change Act 2008." (Portsmouth Water Ltd, 2011, p.1)*

Reporting in response to this kind of mandatory requirement suggests that adaptation reporting at least partly reflects a box-ticking mentality. At the very least, statements like the one above suggest that companies were very conscious about making sure they ticked the box. Reporting protects the firm from penalties or other regulatory risks that may arise from non-compliance. Notably, the fact the ARP only really affected those mandated to report indicates that the ARP has made little impact on the reporting practices of companies outside of its reporting remit.

While the ARP is the only Government-led mandatory requirement, firms in economically regulated sectors like Water have other legal responsibilities to report on adaptation. In particular, Ofwat, the water regulator, requires Water companies to include information about strategies for managing climate impacts on their operations as part of the price review, the Water Resource Management Plan (WRMP), they submit to them (Bakker, 2000; Berkhout *et al.*, 2006; Arnell and Delaney, 2006; Wilby and Vaughan, 2011; Averchenkova *et al.*, 2015). This regulatory requirement was noted in 68% (13 of 19) of the Annual reports of Water companies in the sample. As the following interviewee explained, climate adaptation has been integrated into wider business strategy planning within the sector because Ofwat made adaptation a legal responsibility:

[59] Of the 19 case-study companies, 8 were mandated and report, 5 were non-mandated but report, and 6 were non-mandated and do not report.
[60] 60 of 176 sampled companies were mandated to respond to the ARP's first round of reporting (see Chapter 4).

> *"As requested by Ofwat we have integrated climate change adaptation and a detailed risk assessment into our business, specifically through the WRMP. For every bit of weather dependent investment we propose, we have thought about climate change and done a very detailed risk assessment. Some areas are more mature than others, where weather is critical, such as sewage works, and coastal erosion." (Water A, Interview 1)*

These regulatory pressures may explain why so many Water companies publicly disclose adaptation information (see Chapter 5). Beyond regulatory compulsion a related driver for adaptation reporting is that adaptation information can also be useful in supporting bids to the regulator for higher prices. For example this company used adaptation information to make a case to the regulator for an investment programme to enhance the resiliency of their infrastructure and reduce the risk of changing weather and climate conditions.

Direct experience of changing weather and climate conditions is a second driver of adaptation reporting.

> *"It's clear that our climate is already changing, and our business needs to be able to cope with extreme weather events. We believe forward planning is key to minimising the threats and maximising the opportunities created by evolving climate impacts." (Marks and Spencer plc, 2014)*

In particular, as exemplified above, it is experience with extreme weather that is motivating companies to engage in adaptation. Extreme weather is widely perceived to be a major threat to business continuity because it can highlight significant deficiencies in a company's prevention and preparedness strategies (Agrawala *et al.*, 2011; Amado *et al.*, 2012; CDP, 2014a; 2014b; Averchenkova *et al.*, 2015). One informant explained how extreme weather gave his firm a flavour of the impacts they are likely to face from climate change:

> *"We've seen the impact of a number of pretty extreme weather events. Although you can't attribute individual weather events, at least the ones we have in the UK to climate change specifically, it gives a flavour of vulnerability and where breach points in the system are." (Water B, Interview 1)*

By contrast, other more service-oriented firms felt themselves to be less vulnerable to extreme weather and consequently felt less need either to think about adaptation or to report on it.

> *"No [we don't do adaptation reporting]. There is a risk assessment, but [climate] adaptation is not really a core concern for us. We are service industry. We only really own buildings that have limited vulnerability. So it is not so important. It's not looked at really." (Financial service C, Interview 1)*

This is significant because these firms may not recognise that despite their low environmental sensitivity their company is vulnerable to a range of climate interdependencies (risks) (Averchenkova *et al.*, 2015). Extreme weather not only tests the resiliency of a company's own infrastructure and assets, but it can also have indirect impacts on its supply chains (Næss *et al.*, 2005; Moench, 2009; Ford *et al.*, 2010; Agrawala *et al.*, 2011; Berrang-Ford *et al.*, 2011; Ford *et al.*, 2011; Simonsson *et al.*, 2011; Averchenkova *et al.*, 2015; Hall *et al.*, 2015). Specifically, indirect impacts or interdependencies affect the processes (e.g., rules and regulations) and resources (e.g., water and energy) that a company depends on to operate (Agrawala *at el.*, 2011; Averchenkova *et al.*, 2015). For example, a study by CDP (2013b) on the mining industry noted that climate changes

may jeopardise existing operations as well as future business growth if droughts make regulators more reluctant to grant permits for water access.

Although interdependencies are noted in the adaptation plans submitted to the ARP none cite interdependencies as a driver for reporting. It is the direct impacts of extreme weather that are particularly important in driving reporting, as this interview response explained:

> *"A number of incidents [of extreme weather] have triggered us to look at operational and reputational risks in a different way. Our operations were momentarily diminished which affected us financially and reputationally. It really triggered us to look at our supply chain to understand our vulnerabilities." (Extractive D, Interview 1)*

The financial impacts of extreme weather can be substantial. For example, the 2013/14 winter storms destroyed key sections of Network Rail's coastal rail infrastructure and flooded inland sections that resulted in repairs costing an estimated £170 million (BBC News, 2014; Morris, 2014). But as this informant noted, disruptions from extreme weather events also have reputational costs that companies need to account for.

Reputational concerns are thus a third driver of adaptation reporting. Water companies, in particular, were acutely conscious of the public relations disaster that resulted for Yorkshire Water from its handling of the 1995 drought (Bakker, 2000; Yorkshire Post, 2015) or of the fierce criticisms made by the Pitt Review after the 2007 floods left hundreds of thousands of homes in southwest England without water for weeks. Adaptation reporting is used to manage customer, public, regulator, Government, and media relations.

> *"If we have a situation like last year, where we have unique weather that moves from one extreme to the other, it produces a good reason to talk about risk and vulnerability." (Water B, Interview 1)*

The hope is that adaptation reporting will help minimise reputational damage. By reporting a company can manage expectations by communicating to stakeholders (e.g., investors, regulators, Government, NGOs) that they are taking steps to sufficiently prepare for climate impacts (Agrawala *et al.*, 2011; Amado *et al.*, 2012; Averchenkova *et al.*, 2015). Having a strong and healthy relationship can help minimise the potential negative consequences from not operating such as immediately losing their social licence to operate if stakeholders lose trust (Gouldson ad Bebbington, 2007; CDP, 2014a; 2014b).

Environmentally sensitive companies also used adaptation reporting to reassure insurers and investors that they are resilient.

> *"There are other drivers such as insurance and our investors, where we want to demonstrate that we are managing our risks properly. But having said that I don't think it would have led to a big report on adaptation [like that produced for the ARP]. It is more small summaries and examples." (Energy utility C, Interview 1)*

These relationships are important to this company because there are financial implications when the relationship is negatively affected. For instance, managing their relationship with insurers is increasingly important because as incidents of natural disasters and extreme weather occur more

frequently insurance premiums are increasing. Under climate change there are concerns that affordable insurance may become less available (Tol, 1998; Amado *et al.*, 2012). Reporting can help firms develop a strong relationship with insurers and keep premiums down (CDP, 2012). Adaptation reporting can also help firms reassure their investors, who are also said to be increasingly considering climate resilience as part of their strategic asset allocation (Amado *et al.*, 2012; Grossman *et al.*, 2012).

7.3 Practices of Adaptation Reporting

With only 29 of 176 companies providing any real evidence of adaptation reporting, and only 18 of 60 companies mandated to report to the ARP making their submission available on their website, interviews with the 13 case-study companies that do adaptation reporting provide the primary source of information on reporting practices. Although the sample size is small, interviewees were remarkably consistent in their descriptions of corporate adaptation reporting as a two-step process that is the responsibility of a small team made up of specific employees with specific roles. The following interview response about one company's ARP submission exemplifies how corporate adaptation reporting is generally done:

> *"I was the generalist coordinator who wrote the report and signed it off. But a lot of my writing was editing of texts I would get from principally two other people. One was the water resources manager and the other was the wastewater manager. They are the technical specialists in their areas and provided the text explaining how we would manage our supply assets and our wastewater assets, and how we'd take climate change projections into account when we are thinking about volume of water and wastewater. […] I coordinated and worked out how to write and present our findings. Everything is funnelled through me, but I am not the sort of person engaging at a technical level with all the detailed work that goes on behind it." (Water B, Interview 1)*

More specifically, the first step of data collection is performed by employees with specialist expertise about the operational implications of climate change for the 'nuts and bolts' of the company. That is they are employees deeply and broadly knowledgeable about the company's operations; are technically or scientifically trained in applying knowledge and ingenuity to develop solutions for practical problems; and have expertise that other employees rely on to help overcome issues that prevent them from doing their job. In terms of job titles, they are senior management officers in charge of business functions, specialist engineers, and technical asset managers. These employees generate the context for and content on climate impacts and existing corporate adaptation actions and initiatives. Once data collection is complete this information is sent to the central unit in charge of corporate reporting and compliance with climate regulation. They then review the material to ensure it a) fulfils the criteria of the ARP, b) does not reveal any commercially sensitive information, and c) is user friendly. The existence of such a clear editing phase speaks to the potential for greenwashing.

The fact these roles are so split suggests adaptation reporting is not integrated across a company. Indeed, this two-step process explains why 8 individuals not immediately involved in the reporting remit were unable to explicitly talk about how their the company does it:

> *"My understanding of it is we looked at all of our operations and tried to understand which would have the most significant weather changes the soonest so we could look at doing more detailed studies on those operations, and putting in mitigation or adaptation plans. And that piece of work has been done." (Extractive C, Interview 1)*

The fact only a select range of employees are involved in adaptation reporting supports suggestions made elsewhere that climate science used to inform is not usable by all. Climate science by nature is a technical and multifaceted source of information that requires a certain degree of scientific competence and familiarity with its format and processes to be used effectively (Dessai *et al.*, 2005; Hallegatte, 2009; Amundsen *et al.*, 2010; Tang and Dessai, 2012).

In conducting their ARP reporting, companies tended to follow Defra's guidance. This is shown by two characteristics of their reports. Firstly, they all use UKCP09 in some guise. UKCP09 projections (for more details see Chapter 4) are used to determine what economically, socially and environmentally sensible investments they can make for low, medium and high risk weather events and climate change:

> *"Birmingham Airport has assessed risks of climate change adaptation against information from the UK Climate Projections (UKCP09), produced by the Met Office Hadley Centre, and has chosen to assess its assets and processes against four UKCP09 scenarios." (Birmingham Airport, 2011, p.2)*

Why companies used UKCP09 can be credited to Defra's strategy for exercising the ARP that accompanied the direction to report. Though Defra did not mandate a standard template for reporting it did provide strong guidelines on how organisations should fulfil their statutory requirement to report. In particular, Defra discussed what corporate information should and should not be included (e.g., topics of discussion such as interdependencies, timescales, uncertainty), and recommended sources of climate information to enable evidence-based decision-making (e.g., UKCP09, UKCIP) (Defra, 2009)

Secondly, companies all framed their adaptation report as a risk assessment using the risk assessment approach recommended by Defra (see Chapter 4). Reports framed projected temperature, rainfall and sea-level changes as potential risks to business operations, for example:

> *"The climate change predictions for rainfall have the potential to affect a number of products that are currently handled by the port." (Port of Sheerness Limited, 2011, p. 19)*

Supplementing these more general narratives about impacts and risk was a risk assessment matrix that summarised the nature and extent of climate change related risks the company anticipated it would face. While this approach was recommended by Defra, it was also something that companies were broadly familiar with already. Many corporate practices are commonly grounded in a risk analytic approach that: identifies risks; assesses risks; develops strategies to manage risks; prioritises risks; and tackles risks and evaluates progress. As one informant explained:

> *"We kind of mimicked our existing risk management process. We used out risk matrix approach of listing out all the impacts, their likelihood and level of impact. Likelihood and level are then multiplied together to get a score to help us prioritise the most important ones to put in place." (Energy utility C, Interview 1)*

Thus it was straightforward to use a risk matrix to calculate what their current and future climate risks are and determine which should be prioritised.

The tendency for companies to follow Defra's guidance suggests an element of simply going through the motions. Indeed, one company admitted as much in its adaptation report:

> *"To ensure SEW complies with the Climate Change Act and is consistent with the approach outlined in the Defra guidance, the aim of this report is to provide a rigorous and well evidenced risk-based approach to adaptation reporting for SEW." (South East Water Ltd, 2011, p.29)*

Such compliance oriented behaviour is likely to have implications for the degree to which adaptation reporting is able to spur wider changes in organisational response to climate change. If the aim of adaptation reporting is merely to comply with the obligation to do so, companies may not make much effort to understand or reduce their true vulnerabilities to climate change.

With the adaptation reporting practice framed as a risk assessment, "it is important to consider whether and in what way adaptation to climate change means anything new or different for business" (Averchenkova *et al.*, 2015, p.3). Changing weather and climate conditions have long been a concern for environmentally sensitive companies that rely on the availability of natural resources (Adger *et al.*, 2009a; Preston *et al.*, 2013). For these firms, anticipating and responding to the potential impacts of weather and climate is business-as-usual and is integrated with wider efforts to manage external changes and stressors (e.g., economic regulation). Indeed, many of the sampled companies doing adaptation reporting state that some climate impacts are already included in their existing risk management frameworks, for example:

> *"Many of the operational risks are, however, addressed within existing business risk management and operational procedures…." (London Luton Airport. 2011, p.II)*

It is therefore likely that some companies are adopting continuous adaptation behaviour without them acknowledging it as adaptation per se (Gasbarro and Pinkse, 2015). This similarity may explain why a primary driver of reporting is regulation and why few companies have specific adaptation reporting practices.

It has been suggested in the literature that firms may regard climate adaptation as a somewhat artificial concept (Berkhout *et al.*, 2006). For other companies corporate adaptation reporting may neglect the unique issues faced by different business functions, infrastructure and assets. A handful of interviewees expressed an opinion that their infrastructure and assets are location specific, and as such best managed by using well-established risk management knowledge. As a result they see little value in engaging beyond what they already do. These perceptions likely have implications for whether and how companies use climate information for decision support.

There is also some evidence to suggest that there is a slight variation in reporting maturity. Mature reporters typically have a high environmental sensitivity because of extreme weather. Water companies in particular rely on the availability of natural resources to operate. Adaptation is widely seen by interviewees from Water companies as something they have long done, but it was not necessarily called adaptation before:

> *"We are very reliant on the weather so regardless of climate change we would have those plans in place. I think that often these plans can represent adaptation. And I think that is what the adaptation plan is trying to do, make businesses aware that some of their activities can be classed as adaptation. But this is not a new thing for us as a way to cope with the weather." (Water D, Interview 2)*

This suggests some maturity in their reporting. In addition, Water companies have had to report to Ofwat:

> *"We've been doing this type of reporting with Ofwat, who are increasingly asking for more within the industry regulatory framework." (Water A, Interview 2)*

As a result, they were more confident in talking about their reporting practice. Because of this maturity some expressed an opinion that the ARP was burdensome:

> *"It [the ARP] was more of an external reporting hurdle that we needed to cross over to meet Defra's requirements." (Water B, Interview 1)*

By contrast less mature companies hired consultants to assist in identifying climate impacts, and how to format an adaptation report:

> *"We ended up hiring some consultants to help us report because we are relatively small in comparison to the bigger generation companies. It made sense to get that support." (Energy utility D, Interview 1)*

Contracting out in this way probably suggests the company is just reporting for the sake of it. If they were really serious about adaptation they would have probably done it themselves (off their own bat) in order to develop a more complete understanding for the nuances of adaptation.

7.4 Impacts of Adaptation Reporting

There is relatively little evidence that adaptation reporting has affected organisational cultures and behaviours. This is partly because few companies (50 of 176) provide adaptation information in their Annual reports, websites and other corporate documents, and only 9 of 36 interviewees confidently spoke about their company's adaptation reporting practice. What evidence there is suggests that the greatest impacts of adaptation reporting have been on the way that less mature reporters assess and understand the resiliency of their infrastructure and assets.

> *"In terms of the specific impacts [of adaptation reporting] I would need to get the information from our engineers. But essentially we are now looking at sites we think are most at risk. What we do in terms of site protection. How we can enhance that, and how we can make sure the infrastructure is okay to withstand a flood." (Energy utility A, Interview 4)*

Though this interviewee was unable to provide specific details s/he does comment that adaptation reporting has impacted the firm's overall approach to assessing, monitoring and managing business risks. That is, adaptation reporting has changed the company's understanding and perception about what weather and climate conditions their infrastructure can withstand, which helps to highlight areas of priority that need strengthening. In this instance adaptation information is now used more readily to inform corporate decision-making.

In addition, there is evidence that adaptation reporting for environmentally sensitive companies, which are often mature reporters, is a useful taking stock exercise to look at their risks in a different way. In particular, according to 4 of the 9 interviewees able to speak confidently about their own firm's adaptation practice, reporting has enhanced their company's knowledge about the interdependencies from changing weather and climate conditions:

> *"[Adaptation] reporting is a useful taking stock exercise. We've begun to think about things, issues and risks, in a different way. We are thinking more about interdependence with other sectors." (Water C, Interview 2)*

While not stated quite so explicitly as this informant, 4 interviewees also indicated that the enhanced knowledge of interdependencies developed through adaptation reporting had changed their firm's relationship with key suppliers and encouraged them to make sure their supply chains are resilient:

> *"It is all very well for us being resilient, but if the people you buy your services from are not resilient then there is a real risk to you and your customers. It benefits you to make sure those around you are resilient because it will ultimately reduce your risks and costs in the long-term. Our supply chain is important. Reporting helps us identify weaknesses in the system that can be improved." (Water C, Interview 2)*

While this informant attributes substantial organisational changes to reporting, evidence from other interview participants and the desktop review raises the question of whether these efforts can be attributed to reporting per se or to other factors, such as regulation. The pattern of adaptation reporting suggests that regulation is the key driver of reporting. Of the 50 companies doing some adaptation reporting, 35 are mandated to respond to the ARP's first round of reporting. Of these many noted that their adaptation report was produced because of regulatory compulsion. In fact, 15 (of 35) companies openly stated that their submission was the first time they had specifically engaged and written an adaptation report.

> *"[We have] not previously undertaken any explicit climate change risk assessment. Identified issues which potentially impact directly on business continuity are considered within the Business Continuity Management System." (PD Teesport, Ltd, 2011, p.i)*

Such comments suggest that the internal benefits highlighted by the Transport company above would not have occurred in the absence of a mandatory requirement to report. Indeed, mature reporters of adaptation reiterate the importance of this mandatory requirement. Six case-study companies indicated that although they were familiar with the concept of climate adaptation they had never produced such a standalone formal report before the ARP.

> *"For me it was welcome ammunition to really go and push the adaptation agenda. It [the ARP] was a bit of prod for the company to start thinking about it more formally. As a Water company we manage weather all the time, it is our day job. We had lots of good practice in isolated pockets, but that was not always put together coherently. The ARP gave us a real driver to do that work. The black and white regulatory stance was very helpful." (Water A, Interview 2)*

For this interviewee, though pockets of good practice existed within the firm there was no internal incentive to connect them. Business functions were largely left to their own devices to manage climate impacts as part of their normal risk management because that is where it had traditionally resided. However, the ARP produced a formal obligation for companies to look across their business as a whole to produce a company-wide assessment to lay the platform for more systematic implementation of climate adaptation measures.

Yet, beyond changing reporting practice, the ARP, and adaptation reporting more generally, have not necessarily led to much additional implementation of harder adaptation action or wider organisational change. For mature reporters of adaptation the ARP is said to have only made them re-label existing corporate activities as adaptation, for example:

> *"No we've disclosed on adaptation-related measures before, for instance, to Ofwat. It was the first time we've labelled adaptation in that way, and to that degree of analysis." (Water E, Interview 1)*

In this instance, the changes initiated by the ARP are more symbolic than real. Likewise, for less mature reporters of adaptation the general consensus of 5 interviewees was that the ARP's biggest impact was to make them establish a formal reporting process, which promised to be useful if required to report again.

> *"The good thing it did was put in a process, so we are now set up to look at this. We know what the topic headings are, we can do it quickly." (Energy utility C, Interview 1)*

These impacts of the ARP strongly suggest many of the impacts to organisational culture and behaviour from reporting occur because of box-ticking. Companies are often more concerned about ensuring compliance than doing anything substantial with the information contained in their reports.

While adaptation reporting has raised internal awareness and enhanced knowledge it has not impacted decisions concerning everyday operations.

> *"It [the ARP] is not really affecting our everyday operations. […] It's all about priorities. What are the things we do that can affect us from a business resiliency point of view." (Energy utility B, Interview 3)*

Instead, what appears to be more important in impacting organisational cultures and behaviours, as noted by other studies (Berkhout *et al.*, 2006; Hallegatte, 2009; Agrawala *et al.*, 2011; Gledhill *et al.*, 2013; Averchenkova *et al.*, 2015), is a company's exposure to negative experiences with extreme weather events. It was found that when a company's business performance is severely affected they are most likely to implement climate adaptation measures. For example, the impacts to business performance caused by the 1995/96 drought motivated this Water company to install a new water grid system to better cope with such conditions if they occurred again:

> *"The biggest adaptation we did was to respond to the 1995/96 drought, which had financial and reputational implications for us. That's when we implemented a water grid system where we pump water from one part of the region to another." (Water A, Interview 2)*

Therefore, as Gasbarro and Pinkse (2015) noted, it is the stability of the operational environment and key resources used by firms that affect risk perceptions and decisions to act. Without experiencing a certain level of impact (e.g., major damage to critical infrastructure) companies are less likely to make changes of their own free will because of the aforementioned cost and uncertainty of applying adaptation measures. This might explain why companies with a high environmental sensitivity are the most commonly identified companies talking about climate adaptation in the sample (see Chapter 5). They rely on the availability of resources to operate.

Notably, extreme weather may create a "window of opportunity", particularly for economically regulated companies, to implement climate adaptation measures that had been previously discussed internally but could not be justified externally to their regulator (Amundsen *et al.*, 2010). That is, in instances when infrastructure is severely damaged and needs to be repaired, an economic regulated company may capitalise on the opportunity to justify to the regulator that additional capital investment is needed. For example, Network Rail whilst repairing damage caused by the 2013/14 winter storms built in additional resiliency into the system they had been planning (BBC News, 2014; Morris, 2014).

The problem of experience is twofold. First and foremost, companies without experience fail to recognise the potential climate impacts to their company and thus tend to underinvest in preparedness. Secondly, even though companies with experience are acting it is possible they may develop set of assumptions about what their climate impacts will be. The result of which may lead to complacency and subsequent surprise (Gasbarro and Pinkse, 2015).

There is also evidence that the economic cost of implementing adaptation measures is more of a driver for action than reporting per se. That is, economic budgeting is an important determinant in the consideration of implementation (Fankhauser *et al.*, 1999; Lorenzoni *et al.*, 2000a; 2000b; Dessai *et al.*, 2005; Adger *et al.*, 2007; Agrawala *et al.*, 2011; Preston *et al.*, 2013; Averchenkova *et al.*, 2015; Gasbarro and Pinkse, 2015). Companies want to ensure investments in climate adaptation are economically beneficial or do not negatively affect near-term profitability. More often than not, climate adaptation measures are perceived to be costly and immediate, while the benefits from them, in terms of damages avoided, are both uncertain and distant in time, if not altogether hypothetical. As expressed by the following interviewee, the economic benefit of implementing climate adaptation is marginal and not worth the success:

> *Adaptation does not make money, so not really worth it. Building pipes underground instead of above ground for greater stability to meet permafrost melt changes would not bring that much more profit, so the cost and benefit is marginal. (Extractive A, Interview 1)*

Similar doubts about the business case for adaptation were expressed by 6 other interviewees. This perception partly exists because adaptation measures require significant upfront investment that provides no indication of success or failure until long into the future or after an event of significance has rigorously tested it (Agrawala *et al.*, 2011; Markandya *et al.*, 2014). It is inherently difficult for adaptation reporting to aggregate and quantify adaptation information ('7.2 Rationales

for Adaptation Reporting'). Decisions on when and how to adapt "not only depend on costs and benefits, but also on the process of receiving and interpreting climate change signals" (Berkhout *et al.*, 2006, p.153). Companies want to understand the impact of implementing adaptation on their business performance. "Numerous financial models exist to help quantify risk (e.g. Extreme Value Theory, Stochastic Differential Equations, System Dynamics Simulation, fuzzy logic) and put a value on averted losses for a range of adaptive actions" (Network for Business Sustainability, 2011, p.4). However, models often fail to fully characterise adaptation in financial (and non-financial) terms that would make it a higher priority:

> *"If adapting to climate change was going to have an impact on business operations it would move up in our agenda. And then it would become a central theme. I don't think it is at this point in time because you cannot quantify it enough." (Extractive D, Interview 1)*

Without hard numbers, this informant found it difficult to justify investment for large climate proofing measures. Despite the political and social argument that operating costs in the future (under projected climate change) can be reduced by implementing hard measures now, adaptive responses are typically interventions that can be adjusted marginally and in step with climate changes that can closely follow the dynamic development of the situation. Low-hanging fruit and "no-regret" interventions are applied because they are less burdensome and carry a lower financial risk. That is, they are low cost, easier to reverse if required, and yield benefits regardless of whether predicted climate impacts materialise (Hallegatte, 2009; Markandya *et al.*, 2014; Averchenkova *et al.*, 2015). Therefore, financial risk continues to slow the progress of widespread climate adaptation in the business community (Berrang-Ford *et al.*, 2011; Ford *et al.*, 2011; Preston *et al.*, 2013).

This is not helped by the mismatch between adaptation measures and corporate business planning horizons. Climate impacts, which often have a long-term timescale, go beyond the short- and medium-term investment decision cycles of corporate strategies (McKenzie Hedger *et al.*, 2008). This is articulated well by an Energy utility representative who, used UKCP09 to inform their reporting, but complained that the information it generated was at too distant a time scale to be useful for the business:

> *"I used UKCP09 to help identify our regions climate for the future. While it can be used to identify processes and inform the way you plan, which is useful, a lot of the changes identified were not very significant and so far out. Other more pressing issues like staying in business tomorrow and the next year are more influential. Trying to worry about 2025 is a bit odd." (Energy utility B, Interview 2)*

The magnitude and timing of impact does not match their normal planning horizon. As a result, information produced by climate projections like UKCP09 is not perceived to be especially useful or usable for the kind of decisions that concerned the business. This is something also noted by companies in their adaptation report (made publicly available). For example, although Birmingham Airport used UKCP09 information it noted gaps in information for key weather variables:

> *"Birmingham Airport found the UKCP09 information invaluable in completing its analysis, but it has also highlighted areas where additional information on extreme weather events, particularly increased wind gusts, changing wind direction and wind shear, would be useful in future." (Birmingham Airport, 2011, p.3)*

As a result, they developed their own model to understand how climate change affects specific areas within their administrative boundaries. This finding supports wider arguments that much of climate science produced ostensibly to inform decision-making and actual policy processes is disconnected from practice (Lemos and Morehouse, 2005; Hallegatte *et al*,. 2007; McNie, 2007; Sarewitz and Pielke Jr, 2007; Vogel *et al*., 2007; Moser *et al*., 2008; Hallegatte, 2009; Dilling and Lemos, 2011; Meyer, 2011; Wilby and Vaughan, 2011; UKCIP, 2011; Tang and Dessai, 2012; Preston *et al*., 2013). The result of these difficulties is that companies often take a no or low risk adaptation approach even if they identify additional risks and opportunities (Berkhout *et al*., 2006).

7.5 Discussion

In a sample of 176 companies only 50 reference the term 'climate change adaptation' (see Chapter 5), and even fewer (29 of 176) provide any evidence that they are doing specific adaptation. The 50 companies that do report principally represent environmentally sensitive sectors[61] (34), and firms mandated to report to the ARP's first round of reporting[62] (35).

Rationales for adaptation reporting are linked to regulatory, financial and reputational risks. Specifically, for many companies adaptation reporting is clearly motivated by regulatory compulsion and a strong desire to be compliant. Companies (35) expressed the statutory obligation to respond to the ARP as a rationale for adaptation reporting; with 19 economic regulated companies also citing other regulatory mechanisms that drive engagement in adaptation reporting. This is supported by the fact non-reporting firms allude to the lack adaptation regulation they have as a rationale for not reporting. It is possible that without the ARP even fewer companies would report, as many of the non-reporting firms are unwilling to disclose commercially sensitive material or participate in reporting that may have negative publicity.

In addition to regulation, adaptation reporting, particularly for environmentally sensitive firms, is also motivated by lessons learned from negative experiences with extreme weather. The direct physical impacts of extreme weather have reputational and financial repercussions for a company by disrupting their ability to operate. For example, if extreme weather damages an Energy utility company's sub-stations and transmission lines they will not only have to repair the infrastructure at a cost but there also may be negative publicity if they fail to provide electricity to residential homes, as well as potentially pay compensation if homes are without power for a prolonged period. In this instance adaptation reporting is about defending the company's brand to minimise the impacts on

[61] The sectoral breakdown of the 34 environmental sensitive companies is 13 Energy utility, 6 Extractive, and 15 Water.
[62] The sectoral breakdown of the 35 firms mandated to report to the ARP's first round of reporting is 13 Energy utility, 7 Transport, and 15 Water.

business performance. Companies use it as an opportunity to communicate to its stakeholders that they are prepared to cope with changing weather and climate conditions.

It was found that the practice of adaptation reporting is not widely known across a company. Only interview participants (9 of 36) directly involved in the adaptation reporting practice were capable of explaining what and how reporting is done. They indicated adaptation reporting is a two-step process that is not integrated throughout the company. Specifically data collection, the generation of context and content is the responsibility of individuals with specialist expertise to deal with the complexity of climate change and understand the 'nuts and bolts' of the company. They employ a risk analytic approach because it is a process they are familiar with. This information is then sent to individuals in charge of corporate reporting who provide gloss and proof-read the material to ensure the requirements of what it is being used for is met, and no commercially sensitive information is released. It was found that environmentally sensitive companies, particularly Water companies due to their economic regulation as well, were the most mature in their reporting because of their greater experience with extreme weather.

Due to the rationales for and practices of reporting, climate adaptation is not seen as core to the business strategy. Evidence indicates the act of reporting itself does not drive much action that would not be taking place for other reasons. In fact, the changes to internal organisational dynamics identified—establishing a reporting practice, or formalising previous thinking and re-labelling—are primarily the result of a regulatory driver (e.g., the ARP). Notably, these changes identified align differently depending on a company's reporting maturity. The most mature reporters explained that the ARP did not have much impact on them because they have long performed this type of thing. By contrast the least mature reports expressed the ARP initiated their adaptation reporting practice.

In the absence of specific adaptation requirements or targets, reporting tends to be decoupled from business strategy and decision-making due to three reasons. First, the practice of adaptation reporting carries striking similarities to normal risk management processes. As a result, companies fail to recognise the differences between these two practices, and the need for a deeper engagement in climate adaptation. This is not helped by a second factor. Adaptation reporting does not match the short- and medium-term investment decision cycles in which companies primarily operate. The long-term nature of climate adaptation and the cascade of uncertainty in climate change nullify the role reporting plays in investment decisions. Even with better information about the risks from climate change, adaptation often seems too costly and the benefits too distant in time. Companies would rather wait and see than implement measures that are costly and may not even be successful. Thirdly, adaptation reporting may enhance understanding but it is lessons learned from experience with extreme weather that really influence decisions to act. It would appear that the more negative experience a company has the more likely it is to do something to avoid it occurring again. Thus reporting can be useful in highlighting issues, but there needs to be hard facts to change organisational culture and behaviour. This finding supports arguments that awareness of an issue or a topic through reporting does not necessarily lead to behavioural change (Bulkeley, 2001; Demeritt

and Langdon, 2004; Amundsen *et al.*, 2010; Agrawala *et al.*, 2011; Berrang-Ford *et al.*, 2011; Ford *et al.*, 2011; Haigh and Grriffiths, 2012).

Reading across the components of reporting—rationales, practices and impacts—there are clear differences between companies with high environmental sensitivity and low environmental sensitivity. Companies with high environmental sensitivity tend to be proactive in their actions, and at least aware of the impacts from environmental issues such as climate change. Many of these firms project a legitimacy-seeking rationale for reporting because they need to defend their reputation by showing how much they have done to manage the risks from climate change. Their high susceptibility to direct physical impacts can quickly put their licence to operate under threat if they fail to deliver services. Therefore, reporting bout their climate impacts and actions to cope with these helps to build trust and assure interested parties they are aware of their risks; and in the event of failure understand how to react to minimise longer term effects. At the same time, environmentally sensitive companies rely on the availability of natural resources that will be threatened by climate change both directly and indirectly through increased competition or regulatory responses. Therefore, reporting is an important mechanism to manage their relationship with stakeholders to ensure they continue receiving the same access. By contrast companies with low environmental sensitivity have less experience with extreme weather, and are less reliant on natural resources. As a result they are less likely to report because they do not consider adaptation as strategically important. Given this perception they are less concerned about losing their licence to operate as a result of climate change. Any adaptation reporting by these firms is more typically driven by corporate desires to enhance their reputation through market differentiation. Doing some adaptation reporting will sit well with socially and environmentally conscious stakeholders such as potential investors looking to invest in ethical and sustainable firms that represent value for money.

There also appears to be a difference between companies that are mandated to report (to the ARP's first round of reporting) and other non-mandated companies. Mandated companies report because they have to. Reporting ensures they are compliant, which helps to manage their relationship with the regulator. This can stave off additional more stringent regulation on climate adaptation, which they are incentivised to avoid because of the cost and uncertainty attached to action. By contrast, non-mandated companies largely don't report at all. If they do it is likely that they are seeking to enhance their reputation. They are not required to do anything and therefore can establish a market differentiation that attracts socially and environmentally conscious investors. But due to cost and uncertainty attached to action there are few companies doing this. Thus it is hard to establish whether a firm is being legitimate or greenwashing what they are doing.

Given the apparent importance of these two corporate characteristics, environmental sensitivity and statutory obligations, in affecting adaptation reporting it is possible to create a two-by-two table (Figure 7-1) that predicts four broad categories of adaptation reporting response in the UK business community.

	High environmental sensitivity	**Low environmental sensitivity**
Mandated to report	***Category A*** Compliance and legitimacy-seeking e.g., reporting and action occurs to comply with regulation and minimise the potential reputational consequences caused by future incidents of not being able to operate.	***Category D*** Compliance e.g., reporting is about being complaint, but they lack action because they lack negative experience and pressure to change.
Non-mandated to report	***Category B*** Legitimacy-seeking (to defend reputation) e.g., reporting and action can defend their licence to operate and ensure they maintain the same degree of access to natural resources.	***Category C*** Legitimacy-seeking (to enhance reputation) e.g., reporting and action is an opportunity to develop market differentiation.

Figure 7-1: Sector characteristics that affect corporate adaptation responses

Companies falling into Category A have a high environmental sensitivity and are mandated to report (Figure 7-1). Generalising from the findings in this chapter it is possible to suggest for these firms adaptation reporting is likely to be driven both by compliance concerns and experience of negative impacts with extreme weather. Potential failures as a result of climate change are bad for them commercially, financially, and reputationally. Reporting and taking steps to reduce their vulnerabilities are important to ensure business continuity because failure to do so will lose their licence to operate from the regulator. Alongside case-study sectors Energy utility, and Water, the Transport sector is likely to fall into this category. Transport companies were mandated to report in the ARP's first round, and they have extensive negative experience on operations due to extreme weather. Reporting will help manage their relationship with the Government, their regulator, potential investors, and shareholders by being compliant, and communicating their preparedness.

Companies fall into Category B if they have a high environmental sensitivity but are not non-mandated to report (Figure 7-1). It can be anticipated that adaptation reporting for these firms is about ensuring their business continuity because of their sensitivity. Because they are not critical infrastructure their reliance on sensitive resources is a big issue since their access may be the first to be reduced in the future. Reporting can manage their relationship with stakeholders by gaining legitimacy among regulators and the Government that they are preparing or are prepared to cope with climate change. Alongside case-study sector Extractive, the Industrial, and Consumer staple sectors are likely to fall into this category. Both sectors have a high environmental sensitivity because they rely on the availability of natural resources and energy to operate, but do not have any obligation to report. Therefore, reporting and adaptation measures are likely to be primarily driven

by the desire to manage their relationship with potential investors, shareholders, and regulator to secure licences to operate and long-term access to key resources.

Companies in Category C have a low environmental sensitivity and are non-mandated to report (Figure 7-1). It can be anticipated that adaptation reporting for these firms is about gaining a competitive advantage over their peers. Reporting and action is not motivated by experience because of the nature of their operations and services. They are also non-mandated to report so there is no regulatory compulsion to do anything. Therefore, it is likely that climate adaptation is about legitimacy-seeking to enhance their reputation. Given the lack of experience and regulation it is distinctly possible that these firms may fail to recognise the importance of adaptation reporting and the interdependencies they will face. Alongside case-study sector Financial service, the Consumer discretionary, Healthcare, and Information technology sectors are likely to fall into this category. All of these sectors are less environmentally sensitive than other sectors (despite being prone to interdependencies), and have no obligation to report. Therefore, any reporting and adaptation measures are likely to be driven by perceived opportunities for market differentiation from competitors or a chance to grow the business.

If companies fall into Category D they have a low environmental sensitivity and are mandated to report (Figure 7-1). It can be anticipated that adaptation reporting for these firms is about compliance to the statute. These companies are reporting to report to avoid regulatory and reputational repercussions for not complying. They will not be incentivised by experience with extreme weather to act. Instead actions may occur if they see a potential to develop some kind of advantage for new business if they implement measures and competitors do not. While no case-study sectors fall into this category it is possible to argue that the Telecommunications sector is most likely to. Telecommunication companies are less environmentally sensitive than other sampled sectors, and are not mandated to report. Although, it should be noted Telecommunication companies were invited to participate in the ARP's first (and second) round, and their economic regulator, Ofcom, was mandated to report. Therefore, they are likely to be conscious of the ARP and in some way indirectly influenced by it to report and take action. Nevertheless, due to their lower environmental sensitivity, availability of resources and experience are less likely to be drivers.

As noted and explained in section '6.5 Discussion' (Chapter 6), whilst the four broad categories in Figure 7-1 provide a useful classification of UK-based corporate adaptation responses, it overlooks how firm specific characteristics (e.g., financial performance, and managerial attitudes) can also drive business strategy and performance alongside the more general sectoral characteristics identified in this study (e.g., environmental sensitivity, and statutory obligations) (Barney, 1991). These two firm specific characteristics cause variability between companies that operate under the same conditions, sector or country because they affect a company's ability and flexibility to bear costs of action and consequences of disclosure, as well as overcome internal barriers to action (Berry and Rondinelli, 1998; Branco and Rodrigues, 2006; González-Benito and González-Benito, 2006; Hahn and Kühnen, 2013; Muttakin *et al.*, 2015). Therefore, as done previously, empirical-based assumptions about the influence of financial performance and managerial attitude will be

applied to hypothesise how these two firm specific characteristics may affect and cause variability between companies in each category of adaptation reporting response (illustrated in Figure 7-1). The following affects are hypothesised.

For Category A companies—high environmental sensitivity and mandated to report—adaptation reporting is about compliance and/or legitimacy-seeking (Figure 7-1). Financial performance and managerial attitude are likely to affect whether a firm's relationship with the regulator. Firms with strong financial performance or supportive management will have the capacity and will to work closely with regulators. The benefit of which may help secure licences to operate and avoid stricter restrictions on access to essential resources and penalties for failure to operate. By contrast, firms with weak financial performance or unsupportive management are likely to not have the capacity or will to do this, and will therefore stick with complying.

For Category B companies—high environmental sensitivity and non-mandated to report—adaptation reporting is about legitimacy-seeking (Figure 7-1). Financial performance and managerial attitude are likely to affect whether a firm seeks to enhance or maintain its reputation in order to secure their licence to operate. Firms with strong financial performance have the capacity to be proactive and take actions that will help to safeguard their business. Implementing measures will enhance their reputation. Similarly, supportive management will open doors and encourage individuals responsible for adaptation reporting to explore best practice. By contrast, firms with weak financial performance or unsupportive management do not have the means or will to take proactive actions. Therefore, if adaptation reporting is done, it is something undertaken to defend their licence to operate and match competitors because of failure to lose access to key resources.

For Category C companies—low environmental sensitivity and non-mandated to report—adaptation reporting is about legitimacy-seeking (Figure 7-1). Financial performance and managerial attitude are likely to affect whether a firm attempts to gain a competitive advantage. Firms with strong financial performance or supportive management are likely to take steps that result in market differentiation because they have the financial capacity and foresight to act. By contrast, firms with weak financial performance or unsupportive management are less likely to consider adaptation reporting as an opportunity to take advantage of. The cost and uncertainty of climate adaptation measures too great a barrier because of their financial capacity or lack of managerial interest. If they do anything it is likely to be in response to market conditions or investor requirements.

For Category D companies—low environmental sensitivity and mandated to report—adaptation reporting is about compliance (Figure 7-1). Financial performance and managerial attitude are likely to affect whether a firm sees value in going beyond regulatory requirements. Firms with strong financial performance or supportive management are more likely to explore and implement actions that go beyond statutory obligations because they either have the capacity to cope with the costs of implementing actions that carry deep uncertainty about their success, or have the managerial endorsement to act proactively. The benefit of which may help to avoid more stringent regulation. By contrast, firms with weak financial performance or unsupportive

management who will stick to what is required. They cannot afford and probably do not see the value in taking calculated risks on uncertain (costly) measures.

7.6 Conclusions

Findings here support arguments that awareness of an issue or a topic does not necessarily lead to behavioural change (Bulkeley, 2001; Demeritt and Langdon, 2004; Amundsen *et al*,. 2010; Agrawala *et al.*, 2011; Berrang-Ford *et al.*, 2011; Ford *et al.*, 2011; Haigh and Griffiths, 2012). Whilst getting companies to report on adaptation (in response to the ARP) creates better understanding of what is needed to build resiliency and long-term sustainability, this improved awareness alone is insufficient to make a compelling business case to justify the additional expenditures needed actually to implement adaptation measures. Climate adaptation decisions compete with other strategic considerations that company representatives see as more important for business performance. Thus despite enhanced awareness of climate adaptation in some companies because of mandatory adaptation reporting, most remain reluctant to act. This supports research arguments—looking at climate adaptation in a variety of contexts and scales (e.g., in business, countries, municipalities)—that while efforts to plan for climate adaptation have increased, their translation into actual adaptation practice is still scarce and constrained by multiple barriers (e.g., the cost of action and uncertainty about their effectiveness; unfamiliarity with climate science; experience of potential impacts on business performance; and unclear or inconsistent governance) (Fankhauser *et al.*, 1999; Sarewitz, 2004; Dessai *et al.*, 2007; Hallegatte, 2009; Amundsen *et al.*, 2010; Biesbroek *et al.*, 2010; Linnenluecke and Griffiths, 2010; Moser, 2010; Linnenluecke *et al.*, 2011; Berrang-Ford *et al.*, 2011; Ford *et al.*, 2011; Preston *et al.*, 2011; Archie *et al.*, 2012; Linnenluecke and Griffiths, 2012; Linnenluecke *et al.*, 2013; Bierbaum *et al.*, 2013; Wise *et al.*, 2014; Averchenkova *et al.*, 2015). It counters some arguments that awareness of possible climate impacts can drive corporate adaptation and lead to anticipatory adaptation responses (Arnell and Delaney, 2006; Hoffmann *et al.*, 2009; Linnenluecke *et al.*, 2012; Gasbaroo, 2013; Averchenkova et al., 2015). Before a company embarks on adaptation they also need to be concerned about the potential impacts on its business performance. This suggests decisions are context-specific, and there is a wider endemic for climate adaptation.

Although awareness and acceptance of the need to adapt is growing, until adaptation measures become perceived as affordable; translation of climate science improves or becomes more aligned to stakeholders needs; stakeholders priorities change; and there is clarity in adaptation policy, implementation will always lag behind. This is an interesting finding since one might assume the business community should be less restricted by these traditional enablers and constraints. This chapter has demonstrated that incentives to implement adaptation are not strong enough to overcome entrenched attitudes on climate adaptation. The potential long-term benefits from adapting are not in the same language corporate business use to make decisions.

Reporting can raise awareness of their risks but the fact remains if the cost of action and uncertainty about its benefit are too high companies are unlikely to take steps to adapt. Moreover, it would appear extreme weather events play a greater role in stimulating adaptation action than knowledge of climate change (Berrang-Ford *et al.*, 2011). Arguably reporting may paradoxically inhibit action because many identified climate impacts, in particular major vulnerabilities, are often too costly and uncertain to address. This compounds the rationale for not reporting certain pieces of information perceived to be confidential or a potential source of negative publicity. It further suggests corporate adaptation reporting is more about legitimacy-seeking rather than win-win outcomes.

Although there are a variety of ways that adaptation can be performed – proactive or reactive, autonomous or planned (Smit *et al.*, 2000; 2009) – this research like others (Kolk and Pinkse, 2005; Amundsen *et al.*, 2010; Haigh and Griffiths, 2012; Gasbaroo, 2013; Juhola, 2013; Averchenkova *et al.*, 2015; Gasbarro *et al*, 2015) has shown that climate adaptation in the business community is largely reactive rather than anticipatory. Despite rationales for and approaches to reporting suggesting planned adaptation, the impacts of reporting overwhelming indicate it is a reactive practice. In addition, adaptation measures largely resemble facilitation rather than implementation. They appear to enhance the adaptive capacity (e.g., data collection, establishing reporting networks) instead of actually avoid adverse climate impacts on the system (e.g., reducing exposure or sensitivity) (Füssel and Klein, 2006). These findings combined with the low number of companies with hard measures suggest climate adaptation is a secondary measure in the business community. It is possible to argue that unless a company's business performance is severely affected they are less likely to plan or implement proactive adaptation because of the costs, uncertainty and importance of experience. This attitude to climate adaptation is likely to create maladaptation across the business community as they continue to neglect specific long-term adaptation planning and interdependencies.

Given that it is possible to question the function of corporate climate adaptation reporting. Arguably its current function is about telling interested parties that the firm is doing something, but it is not a priority affecting activity because of the uncertainty about the accuracy of reporting and taking actions. It is possible to argue adaptation reporting is a symbolic practice, which is more concerned about maintaining the image and legitimacy of the company than raise adaptive capacity. Many companies appear to selectively disclose information, choosing to withhold facts that are commercially sensitive or do not reflect favourably. This suggests a degree of greenwash (Lyon and Maxwell, 2011). Indeed, adaptation plans submitted to the ARP resemble the characteristics of a fantasy document (Clarke, 1999). It was produced in response to a regulatory requirement to protect corporate reputation. It is designed to look like an adaptation plan by outlining the climate impacts a company faces and identifying ways in which these can be addressed. It utilises climate science to add credibility, legitimacy and saliency to its arguments, which in turn helps it meet regulatory requirements. However, the plan does not affect business performance or the way firms operate. Instead the combination of cost, experience, and confidence in climate science are the

main factors in affecting decisions to adapt. Consequently, a case can be made that the climate actions identified and presented in an adaptation plan are unrealistic because planning for future climate change is an improbable task (Clarke, 1999). Arguably adaptation plans are more a tool of persuasion and compliance than a realistic strategy to help the company operate. Indeed, the same can argued about business contingency plans, which hold manner similarities to adaptation reporting. Bloom and Menefee (1994, p.230) noted contingency plans "may be so divorced from reality that they are not only useless but misleading. It is important to be aware that actual circumstances almost always differ from the expected".

This raises a question about the mode of governance used in the ARP's first round. In particular, it questions the ability, scope, and impact light-touch forms of regulation relying on nudge principles can actually have in stimulating companies (stakeholders) into certain behavioural changes concerning topics or issues that society is neither engaged nor knowledgeably of. Nudging relies on society or stakeholders outside of the regulatory environment to pressurise companies into change. The problem for the ARP resides in climate adaptation being a low priority in our attempts to address climate change. It is and will for the most part remain a secondary response to climate mitigation (e.g., reducing GHG emissions). Therefore, nudge principles cannot be applied to all topics. Its application must be carefully considered and applied to topics that have societal currency or otherwise you will get no action beyond reporting, as is the case with the ARP. Instead this finding further supports the idea of a compliance culture in adaptation planning.

Chapter 8 Conclusion

8.1 Introduction

Climate change creates both risks and opportunities for business. It can directly and indirectly affect corporate performance either positively or negatively, the consequences of which have wider repercussions for society. In the UK, for instance, business responses to climate change will affect the degree to which emission reduction targets and resiliency objectives outlined in the Climate Change Act 2008 are achieved. Therefore, efforts have been made by Government, regulators, socially and environmentally conscious investors, shareholders, not-for-profit organisations, and civil society actors to get companies to engage with the issue. One of the primary avenues for this has been through corporate reporting. It is assumed that getting companies to engage with climate change through their corporate reporting will raise awareness and encourage positive actions (Ceres, 2010) such as reductions in carbon emissions, and/or the adoption of measures to adapt to future climate changes (Berkhout *et al.*, 2006; Arnell and Delaney, 2006; Füssel and Klein, 2006; Hoffman *et al.*, 2009). Determining whether reporting leads to (more) action and what factors influence corporate responses to climate reporting was the aim of this study.

An extensive desktop review analysed corporate websites, Annual reports, and CSR reports of 176 business companies listed either on the FTSE 100 or as one of the UK's critical infrastructure providers to determine the scope and patterns in climate information disclosed publicly. This was supplemented by an intensive phase of 36 interviews with individuals representing 19 companies in one of four case-study sectors (e.g., Energy utility, Extractive, Financial service, or Water). These interviews obtained information on the organisational motives (i.e., internal and external factors) that affect decisions to engage with (or not) climate change and to report about it externally. In addition, 24 third party conversations with select stakeholders (Government officials, Regulators, Consultants and Independent body organisations) were held to test the insights developed in the extensive and intensive components of data collection (see Chapter 3 for further details on data and methods). This sampling strategy helped unearth a number of factors that influence corporate decisions about whether and how to report, and about the influence of those reports on decisions to implement climate mitigation and climate adaptation measures.

The chapter proceeds as follows. It begins by summarising some of the main empirical findings of the study. In particular, it documents some general patterns and discourses of climate reporting identified across a 176 company sample, as well as distilling some specific findings about the rationales, approaches and impacts of carbon reporting and adaptation reporting on organisational culture and behaviour. Then, the following section compares carbon reporting to adaptation reporting in order to determine similarities and differences between the two types of climate reporting, and to consider which kind of reporting does what and why. It will particularly explore how the organisational reporting perspectives—ecological modernisation, greenwashing,

and audit culture—affect different types of climate reporting. Then, the next section explains why there is a general rhetoric and reality gap in climate reporting. That is, it discusses how and what factors cause both types of climate reporting to appear largely decoupled from influencing action. Then the chapter considers what the theoretical and practical implications of the study are for organisational management, corporate reporting, environmental management, and policymakers. It finishes by reflecting on some of the limitations in the study and suggests some possible future research avenues that would extend the findings of this study.

8.2 Empirical Findings

Climate change is now part of the common corporate language in the UK business community. This is a change from the 'wait-and-see attitude' of the corporate world during the 1990s (van der Woerd *et al.*, 2003) when climate reporting was unusual (Kolk and Hoffmann, 2007) and the very notion of climate change was contested (Kolk and Pinkse, 2007). Some 93% of companies sampled regard climate change as meriting at least a mention on their corporate website, and in their Annual and/or CSR reports (see Chapter 5); with most of these companies (140 of 176) disclosing substantial climate information, particularly about their GHG emissions. The number of companies providing climate adaptation information is notably smaller, 50 out of 176.

There is a clear pattern among firms in their levels of reporting (see Chapter 5). A small number of level 0 companies do not disclose any climate information at all. Evidence suggests that decisions not to participate in climate reporting depend on whether reporting is seen to have any reputational or financial value. Disclosing climate information (particularly corporate adaptation-related information) can create competitive disadvantages given its commercial sensitivity, potential unfamiliarity to key stakeholders, and lack of sufficient stakeholder interest (Agrawala *et al.*, 2011; Baglee *et al.*, 2012). Therefore, in some instances non-disclosure can protect the company from some of these risks. Level 1 companies, which are typically non-energy intensive and/or economically regulated, provide some climate information. However, detail is limited and any accompanying discussion lacks depth. Level 2 companies, which typically have mandatory climate reporting requirements, provide basic sets of climate data in tables or figures alongside reflections on their contribution and management of climate risks and opportunities. Level 3 companies, which are typically environmentally sensitive, economically regulated and/or have mandatory climate reporting requirements, provide comprehensive and detailed climate information that is easy to follow because of the terminology, structure, tables, and infographics used to visualise data.

The research also identified three dominant discourses of reporting, each involving discrete frames of win-win scenarios, legitimacy-enhancing strategies, and reactionary responses. These specific discourses of climate reporting broadly correspond to existing accounts of social and environmental reporting in the literature, which approach corporate environmental reporting in terms of ecological modernisation, greenwashing, and audit culture. Significantly, while the climate discourses identified appeared in both carbon reporting and adaptation reporting in the public

domain, they resulted in somewhat different rationales, approaches, and impacts of reporting on carbon and/or adaptation.

For carbon reporting, which 93% of the sample do, rationales for reporting are principally attached to financial reasoning, social pressures, and regulatory compulsion (see Chapter 6). Energy intensive firms in particular tend to be motivated by potential win-win outcomes created by their ability to identify, measure, and monitor emissions and energy consumption. Again based on energy intensity, different firms are motivated by different reputational management opportunities. For energy intensive companies, carbon reporting often involves trying to protect their social licence to operate. The public acceptability of their environmental and carbon footprint is less of an issue for non-energy intensive companies. For them carbon reporting (particularly the voluntary kind) is more typically done with an eye to either mirroring the reporting activity of competitors or alternatively trying to outdo them in league tables monitored by key stakeholder groups. Compliance—or rather the reputational consequences of non-compliance—also drove reporting when there was a statutory obligation to do so.

Although the rationales for carbon reporting were quite various the actual practices of data collection and reporting are fairly standardised. This enables companies to easily transfer data between different forms of carbon reporting they do. In general the responsibility of reporting is divided between central reporting units focused on regulatory compliance and operational business functions that collect, interpret and write data ready for reporting. Yet there is evidence that the degree of autonomy and responsibility given to these two functions differs between energy intensive and non-energy intensive firms. In the former group of firms the central unit's role is managerial and data collection is led by operational units with technical expertise, in the latter group of firms the central unit's role is hands-on and other parts of the business are less involved (see Chapter 6).

Companies associate carbon reporting with a range of easy-to-implement climate mitigation measures that include basic technological (e.g., installing energy efficient technology to reduce emissions) and behavioural changes (e.g., aligning corporate remuneration to emissions performance) (see Chapter 6). According to interviewed companies these changes occur because the board is required to sign off most of the carbon reporting performed, emissions data is readily quantifiable making it easier to understand, and companies are familiar with it. Yet, evidence indicates changes are more likely to be influenced by wider economic (e.g., reducing emissions reduces costs in energy and carbon taxes, particularly for energy intensive firms), reputational (e.g., reducing emissions is a positive story), and regulatory (e.g., reducing emissions fulfils statutory obligation) drivers (see Chapter 6).

Adaptation reporting is much less common, with 28% of the sample involved in it, and the rationales for reporting are linked more strongly to regulatory and reputational risk management instead of financial opportunities for cost saving and profit through emission reduction (see Chapter 7). In particular, companies mandated to respond to the ARP, and economic regulated

firms subject to other regulation, credit reporting to the desire of showing and being compliant. For environmentally sensitive firms reporting is motivated by the reputational and financial lessons learned from direct negative experiences with extreme weather. Adaptation reporting is perceived to be an opportunity to manage their relationship with stakeholders to minimise these reputational and financial risks (see Chapter 7).

In regard to the practice of adaptation reporting, which is most mature in environmentally sensitive firms, it is a two-step process that is not yet integrated throughout the company (see Chapter 7). Data is first collected by individuals with specialist expertise to deal with the complexity of climate change and who understand the 'nuts and bolts' of the company; and then second, data is sent to individuals in charge of corporate reporting who review data for commercial sensitivity. This is partly because rationales for adaptation reporting are defensive, and the practice of adaptation reporting is not well integrated across companies. Interviewees did not perceive adaptation reporting—or indeed climate adaptation itself—as an important influence on internal organisational dynamics (e.g., establishing a reporting practice or formalising previous thinking and relabeling).

Where adaptation actions are taken it is for reasons other than reporting (see Chapter 7). Lessons learned from negative experience with extreme weather appear to be integral in getting companies to appreciate potential future climate impacts (see Chapter 7). This is because many companies fail to recognise that adaptation reporting is different to the normal risk management they do because of striking similarities between the processes of the two practices. In addition, adaptation reporting's long-term nature does not match the short- and medium-term investment decisions cycles in which companies primarily operate.

8.3 Comparing Carbon Reporting to Adaptation Reporting

Carbon reporting is a mature and well-established part of the business reporting landscape (Okereke, 2007; Kolk and Pinkse, 2007; Ihlen, 2009; Knox-Hayes and Levy, 2011; Sullivan and Gouldson, 2012; Ihlen and Roper, 2014). By contrast, adaptation reporting is less common, less mature, and less well-established. Companies are, in general, more focused on their role with respect to mitigation—how to reduce GHG emissions, respond to climate policy, and create business opportunities related to both—than adaptation (Kolk and Pinkse, 2005; Eberlien and Matten, 2009; Linnenluecke and Griffiths, 2010; Gasbarro and Pinkse, 2015). Consequently, there is a clear pattern among firms in the degree to which reporting on carbon and adaptation actually influences business strategy. In short, while carbon reporting has influenced the decision-making process concerning energy consumption and direct emissions from it, adaptation reporting has made little impression on any decision-making processes. This difference between the two types of reporting occurs because of four factors.

First, it can be attributed to reporting characteristics. Specifically, the very nature of the data being accounted for in these two different types of reporting is a major factor. Carbon reporting is

mainly quantitative figures on GHG emissions that is typically accompanied by some qualitative explanation of its sources and how emissions totals have changed from year-to-year. By contrast, adaptation reporting involves writing a medium- to long-term narrative that utilises climate science to explain what the company's current and future climate risks are and how the firm plans to address them. Carbon reporting leads to more action because companies can observe real time progress by easily comparing emissions results from one year to another year. Carbon's quantifiability also allows external stakeholders (e.g., Government) to build league tables that drive companies to compete. Companies will either aim to get to the top of table and differentiate themselves or to make sure they at least keep up with the general herd. This is not possible with adaptation reporting. Climate risks and measures to adapt to them vary greatly from one firm to the next. Therefore, it is more complex and less straightforward to compare performance or use reports to drive improvements in it.

Second, quantifiability also influences perceptions about the benefits and certainty of them in taking action. Carbon reporting identifies opportunities to implement climate mitigation measures that carry a low financial risk, whereby business performance is positively affected by implementing 'low-hanging fruit' actions that succeed in the short-term. Adaptation reporting will not identify and feedback whether climate adaptation measures have caused positive changes until several years later. Although adaptation reporting may identify where physical risks can be reduced and thus highlight potential savings, (typically in the form of losses avoided rather than direct financial savings from efficiency gains as with carbon reporting) the cost of adaptation action and uncertainty surrounding the benefits are significant barriers to action. As a result, it is easier to justify mitigation than adaptation because investments can be communicated in terms that are more easily measurable and understood by decision-makers.

Third, differences in how the two reporting practices are organised and conducted are also important. Carbon reporting requires board level sign-off. This gives it a much higher profile than adaptation. In this context carbon reporting was organised hierarchically, with important differences between energy intensive and non-intensive in the degree to which operational business units were given autonomy about the methods of data collection. For energy intensive firms data collection is often technically sophisticated and more autonomous. There are significant advantages both in terms of data quality and economic savings to letting operational staff find the best ways to measure and save energy usage in different parts of the business. By contrast, for non-energy intensive firms there are less economic savings to be made and data collection is more standardised. Often reporting is centralised and typically concerned with simply demonstrating compliance. Without the need for board-level sign-off adaptation reporting was often contracted out. Moreover, even when it was done in-house it was typically the responsibility of a small team with relatively little profile across the organisation. This tendency for adaptation reporting to be devolved to a small and often isolated unit was reinforced by the technical complexity of the climate science used

as a primary source of information. Only a handful of employees have the capability to use climate science appropriately.

These differences in how the two types of climate reporting were done had important implications for the recognition given to the reports in the company (and across the business community), and thus to their wider influence on business strategy and decision-making. Responses indicated carbon reporting is widely known and understood, with adaptation reporting relatively unknown. Indeed, the responses of four individuals from the same company with overlapping responsibilities indicated all are familiar with the company's carbon practice, but only one of them knew about the adaptation practice. This also occurs because there are multiple carbon reporting requirements requiring board sign off, which has raised the profile of emissions as a concern, particularly for non-energy intensive and non-economically regulated firms where it otherwise wouldn't be. There is only one mandatory adaptation reporting requirement, the ARP, which is only applicable to critical infrastructure providers.

Fourth, disparities in the impact of the two types of climate reporting also reflect wider differences to the status accorded to mitigation and adaptation in society at large. Whereas climate mitigation has long been encouraged as a way to tackle the causes of climate change, environmentalists have sometimes framed climate adaptation as a defeatist response to climate change as well as negative thinking. Historically advocates for adaptation were assumed to lack commitment to addressing the causes of the problem, marking them as both irresponsible and unethical (Füssel and Klein, 2006; Pielke Jr *et al.*, 2007; Hultman *et al.*, 2010; Preston *et al.*, 2011; Kahn and Timmons Roberts, 2013). Consequently, companies have tended to emphasise climate mitigation in their responses to climate change. Due to this ingrained condition it is possible that business companies are still inherently concerned about the perception of the company if they talk about engaging adaptation on equal terms to mitigation because it may be interpreted in some circles as not doing their part for society, and/or that they are more concerned about looking after themselves.

Notably these four factors also influence the extent and strength of different organisational reporting perspectives in the two types of climate reporting. It was found that ecological modernisation, greenwashing, and audit culture at varying degrees shape the way companies frame climate mitigation and adaptation information in the public domain (Chapter 5); underline rationales for carbon and adaptation reporting (Chapter 6 and 7); and affect the degree to which carbon and adaptation reporting impacts business performance (Chapter 6 and 7). These differences are summarised in Table 8-a

Table 8-a: Summary of how each organisational reporting perspective exists in carbon reporting and adaptation reporting

Organisational reporting perspective	Carbon reporting	Adaptation reporting
Ecological modernisation	Strong presence because of quantifiability, and mitigation measures compliment corporate profitability aims.	Weak presence because measures are costly, planning horizons do not match, and deep uncertainty.
Greenwashing (legitimacy seeking)	Extensive disclosure as companies provide lots of carbon information to ensure they fulfil stakeholder expectations.	Selective disclosure as companies seek to minimise potential negative impact of reporting on business performance.
Audit culture	Proliferation of reporting, some evidence of reporting fatigue and diminishing influence on action.	Limited reporting or pressure for it; reports largely de-coupled from action.

The first organisational reporting perspective, ecological modernisation, argues reporting is motivated by the promise that protection of the environment will yield positive outcomes for the firm and the so-called 'triple bottom line' (Hajer, 1993; 1995; Spaargaren and Mol, 1992; Gibbs, 2000; Gouldson *et al.,* 2008; Mol *et al.,* 2009). In regard to carbon versus adaptation it was found there is a stronger eco-modernist presence in carbon reporting than adaptation reporting because it lends itself more effectively to managing economic risks and capitalising on economic benefits. This difference is largely due to carbon reporting's quantifiability (Table 8-a) which allows a company to intuitively identify relatively immediate changes in (GHG) emissions totals over a short period of time (Pauw, 2014). Whilst this information informs whether a climate mitigation measure has been successful or not, the real value of this emissions data is its close link to energy consumption, which is in turn connected to net expenditure. Reductions in energy consumption will not only translate into emissions reductions but also into financial savings on energy, which, particularly for energy intensive firms, can be a major contributor to net expenditure. Significantly, this link enables a company to use carbon reporting (i.e., changes in emissions totals) as a way to monitor financial performance. Thus there is a win-win outcome from managing GHG emissions. Carbon reporting is perceived to contribute rather than challenge the profitability of the company. That is there is harmonisation of ecology with economy in the name of enhancing the corporate strategy (Hajer, 1993; 1995; Spaargaren and Mol, 1992; Gibbs, 2000; Gouldson *et al.,* 2008; Mol *et al.,* 2009).

By contrast, adaptation reporting is about identifying climate vulnerability, much of which is a qualitative narrative that is difficult to quantify into economic terms that decision-makers recognise. Moreover, many hard adaptation measures require significant investment that will put the company's profitability at risk because they are not only expensive, but also complicated by their medium- and long-term nature which clashes with short-term cycles of quarterly profit-and-loss

reporting that drive stock values, remuneration and corporate decision-making (Fankhauser *et al.*, 1999) (Table 8-a). Deep uncertainty surrounds key variables such as the extent and degree of climate change, the actions of others, and the future economy (Füssel, 2007; Adger *et al.*, 2009b; Linnenluecke and Griffiths, 2010; Linnenluecke *et al.*, 2012; Mees *et al.*, 2014). It is difficult to reap benefits or show results until climate change occurs or an extreme weather event causes significant damage where conditions are recorded and recognised as different to before. These uncertainties bring into question whether adaptation measures will be successful, and more importantly represent value for money. It therefore might be beneficial to wait because measures may become cheaper or the vulnerabilities are not as bad as perceived. Thus in practice there is less certainty of a win-win outcome from doing climate adaptation, which has affected decisions to engage.

The second organisational reporting perspective, greenwashing (or legitimacy seeking), argues reporting is used instrumentally to enhance corporate reputation and legitimacy with investors, regulators, and other key stakeholders (Deegan *et al.*, 2002; O'Dwyer, 2002; Laufer, 2003; Vos, 2009; Lyon and Maxwell, 2011; Mahoney *et al.*, 2012). Stakeholders (e.g., customers, investors) are said to prefer working with and/or purchasing products from company's perceived to be a respectable and responsible entity in society (Carroll, 1998; Fombrun *et al.*, 2000; Kettis, 2000; Levy and Egan, 2003; Matten and Crane, 2005; Gouldson and Bebbington, 2007; Nyberg and Wright, 2012). In regard to carbon versus adaptation both (despite varying degrees of reporting) are performed to project the image of a responsible and ethical business. Informants perceived making some climate information readily available and taking climate mitigation and/or adaptation measures will give confidence to key stakeholders and assure them that the firm has a good grasp of climate change. Thus the aim is to seek legitimacy for their climate activities.

However, whilst legitimacy seeking exists in both reporting types it is captured differently. For carbon reporting companies attain legitimacy by disclosing a certain amount of information in an accepted format, and by participating in voluntary indexes (Table 8-a). Companies do this because key stakeholders are fairly well acquainted with carbon reporting. GHG emissions, a central component of carbon reporting, are a main topic in climate policy debates. Stakeholders understand where and how emissions can be addressed, and are familiar with approaches to carbon reporting. This has created additional social pressures on companies, particularly economic regulated firms, to perform carbon reporting in certain way, with failure to do so affecting their reputation. Indeed, well before the 2005 Companies Act made it a statutory requirement, there was an increasingly strong social expectation that companies should do carbon reporting. Moreover, key stakeholders can monitor emissions performance because of its quantifiability. Thus to gain legitimacy this information needs to be presented in an overtly positive guise. At the same time, however, the standardisation of carbon reporting puts limits on the ability of companies to conceal poor performance from interested parties.

By contrast, adaptation reporting does not have the same social pressures because it is not as well known due to its low salience in climate policy debates, its relatively new and unique status as a

form of public corporate reporting, and the difficulties in quantifying and comparing the performance of companies in terms of their climate change 'readiness' (Table 8-a). Thus there is not the same requirement to report voluntarily to maintain legitimacy. Nevertheless because of the nature of adaptation reporting, in that it identifies and exposes corporate weaknesses that may be commercially sensitive, and climate adaptation measures are steeped in negativity, a large part of reporting, particularly for environmentally sensitive firms, is about minimising the potential negative impact it could have on business performance. "There is little incentive for companies to identify and publicise the work they are doing on adaptation. Many of the benefits are private and the messages sometimes complex, which give it less potential as a source of positive publicity than action on mitigation" (Agrawala *et al.*, 2011, p.10). Communicating adaptation information in positive terms and clearly is far more complex and burdensome. This may explain why fewer companies publicly disclose adaptation information and less data is provided.

The third organisational reporting perspective, audit culture, theorises corporate reporting as driven not by the potential of positive or negative outcomes from reporting (i.e., attaining a win-win outcome or some legitimacy), but instead as a performative 'condition' where a company 'reports to report' (Power, 1994; 1997; Shore and Wright, 1999; Humphrey and Owen, 2000; Power, 2003; Hodkinson, 2008; Shore, 2008). The primary purpose of reporting is responding and providing the necessary material to meet whatever accountability obligations (mandatory requirements and voluntary indexes) they are subject to. In regard to carbon versus adaptation reporting, the desire to be compliant is the same. The fact they are mandated to report in the first place is enough of a reason to engage in the practice. Thus there is evidence of an audit culture in both reporting practices.

Nonetheless, the strength and organisational impacts of audit culture pressure is different in each case. Forms of carbon reporting have proliferated and companies often find themselves reporting the same underlying data to comply with different carbon reporting requirements from different regulatory agencies and voluntary reporting indexes. Although the similarity between different forms of carbon-focused reporting has improved approaches to reporting and encouraged the implementation of climate mitigation measures, the similarity has stalled innovative thinking. Companies are exhausted by having to report similar, if not the same data in multiple ways, and have become more concerned about ticking the box than identifying additional mitigation measures (Table 8-a). They assume that what they are doing is sufficient because it creates the conditions to be accountable. This finding brings into question whether carbon-based regulation has reached a point of diminishing returns. There is already a plethora of carbon data readily available to the public to inform decision-making. Perhaps instead of requiring companies to report data in a certain format, regulatory focus should be placed on improving interpretation of that data and working out how it can give companies confidence to invest more into making the necessary step changes to abate climate change.

By contrast, adaptation reporting is less common and less well established. Most firms do not do any adaptation reporting at all. When they do, reports are not strongly coupled to corporate strategies and have little influence (Table 8-a). It is arguable whether the ARP, for instance, was developed under gesture politics given its sudden emergence and inclusion in the Climate Change Act 2008, and the change in mode of governance from a mandatory requirement to a voluntary invitation (see Chapter 4). The absence of regulatory clarity combined with the deep uncertainty about climate change, the cost of action, and the novelty in doing adaptation reporting (because it is a new practice for many companies) has resulted in less urgency to act. Companies perhaps lacking knowledge of their risks simply reported to tick the box. This finding further indicates that in the absence of a strong and consistent regulatory framework, as well as few incentives to encourage action, companies are less likely to act (Averchenkova *et al.*, 2015). Such weak and inconsistent regulation can be seen as a "flash in the pan" that initially raises awareness but does not translate beyond.

Although not a focus for this study it is important to mention that an audit culture was also found to have contributed to the proliferation of voluntary forms of climate reporting (see Chapter 6). For many companies participating in voluntary indexes is not about gaining a competitive advantage. Instead, due to reputational risks, companies will start or continue to report voluntarily (even if they see no real positive value in doing so) because there is an expectation and assumption amongst stakeholders that to do otherwise means the company has bad news (e.g., failing to meet emission targets) they do not want to communicate.

8.4 Rhetoric versus Reality: Factors Affecting Change

While the study found climate reporting is a common practice because of economic, socio-cultural, and institutional drivers (see Chapters 6 and 7), reporting has not necessarily translated into action. This contradicts the idea about reporting that "what gets measured, gets managed, and what gets disclosed gets done" (Ceres, 2010, p.33). Reporting has enhanced companies' internal awareness of their relationship with climate change (i.e., their contribution and potential climate impacts). This has caused some changes to internal organisation dynamics, including: their approach to social and environmental reporting; the structure of corporate remuneration; risk management frameworks; and internal and external communication channels.

However, reporting has not necessarily encouraged companies to take the required step changes society needs to tackle climate change. Many changes credited to climate reporting can be classed as the picking of low-hanging fruit because they are easily achieved and do not require much effort. Moreover, an argument can be made that they are more beneficial to the company than to society at large. This finding, that awareness alone of an issue or a topic does not necessarily lead to significant behavioural change, confirms and extends findings of previous studies (Bulkeley, 2001; Demeritt and Langdon, 2004; Amundsen *et al*,. 2010; Agrawala *et al.*, 2011; Berrang-Ford *et al.*, 2011; Ford *et al.*, 2011; Haigh and Griffiths, 2012). In particular, that before a company takes the decision

to act in response to climate change, whether to implement climate mitigation and adaptation, they must not only be aware of the potential climate impacts but also be sufficiently stimulated and/or confident that actions taken will not negatively affect business performance.

Four factors were identified as influencing whether reporting leads to action. Firstly, it was found decisions to act are greatly influenced by their economic cost. The universal nature of climate change is problematic here. The cost of unilateral actions to reduce emissions or increase resiliency are shouldered primarily by the company taking action whilst the benefits are shared by all. Although there are reputational benefits, there is an overriding reluctance to implement costly measures that carry inherent uncertainty in terms of their successful return. What's more, there is fear they could inadvertently create a competitive disadvantage for the company if competitors do not adopt comparable measures (Barrett, 2003; Carbone and Rivers, 2014). These issues combined with additional uncertainties surrounding climate change (e.g., the science, climate policy) and society more generally (e.g., the economy, population growth), result in companies sticking to implementing climate measures that produce a positive financial return or carry a low financial risk for the medium- to long-term nature of business performance. Implementing energy efficient technology, for instance, is seen to be financial viable by energy intensive firms because the benefits typically outweigh the costs (i.e., the combined reduction in energy spend and carbon taxes will offset the costs of implementation). The profitability of the company comes first before any action is taken. If the action negatively affects profit margins it is less likely to be implemented than an action which has positive outcomes.

Secondly, it was found decisions to act are also influenced by social pressures. Whilst reporting will help maintain a company's reputation as a good corporate citizen, implementing climate measures can enhance it (Hoffman, 2004; 2005; Boiral, 2006; Crawford and Seidel, 2013; Averchenkova et al., 2015). This particularly occurred in economically regulated and/or environmentally sensitive firms, where "companies invest in citizenship activities that generate reputational capital" (Fombrun *et al.*, 2000, p.88). On one hand, implementation generates reputational capital that builds a platform from which opportunities may emerge (e.g., develop an advantage to capture new business from ill-prepared competitors). On the other hand, implementation generates reputational capital that safeguards and buffers against potential losses (e.g., a momentary decline in service provided). In a highly competitive market companies continue to use "factors such as corporate values and corporate image to differentiate themselves from their competitor's" (Kettis, 2000, p.42). However, these potential benefits do not always justify or explain to executives, who are primarily concerned about profitability, why costly climate measures should be implemented. Even with social pressure companies tend to only take actions that do not negatively affect profit margins. This finding reiterates an important tension between a company's desire to adhere to social and environmental pressures and protect their competiveness and profitability. While there are reputational factors to reporting, they do not necessarily alter the underlying decisions about whether to act. Despite increased governmental interest in climate

reporting and other non-regulatory means for encouraging pro-environmental behaviour, other issues such as cost of action are perhaps more important in climate decision-making.

Thirdly, it was found that the regulatory and legal environment in which companies operate influences the type of action implemented. Regulation, whether financial or non-financial, is a major, if not *the* motivation for corporate reporting because non-compliance can have serious repercussions for business performance. Mandatory requirements to report force companies to look at their business operations and strategy, which raises internal awareness of how they operate. It carries the potential to enrich the information base upon which environmental management decisions are made. For over a decade companies have been subject to mandatory requirements to report on climate change to the Government and their regulator (Kolk and Pinkse, 2007; Sullivan, 2008; Sullivan and Pfeifer, 2009; Knox-Hayes and Levy, 2011; Sullivan and Gouldson, 2012). Most of these requirements are carbon-focused in that they require companies to disclose information on their GHGs emissions (see Chapter 4). Knowing that reporting is required annually has not only encouraged some companies, particularly economic regulated firms, to improve their reporting approach (e.g., installing new tools and techniques to collect more robust data), but also provided the necessary stability to implement climate measures that in other circumstances (i.e., instability or uncertainty) would not occur. Indeed, the frequency and multiple forms in which companies are regulated to report on their emissions have removed some of their concerns about climate mitigation measures not being value for money because they have to do it to satisfy regulation.

However, there is also evidence to suggest this familiarity in carbon reporting is becoming a hindrance to getting companies to act. Companies have become so accustomed to different carbon reporting requirements for similar, if not the same data, that they largely use the same approaches to reporting and just pull out the relevant data without necessarily using it to inform decision-making. For many they are unable to identify or justify additional actions because reporting does not identify anything new. By contrast the new regulatory framework for climate adaptation does not appear to do a lot because it is new and is unlikely to be repeated again in its present mandatory form. These difficulties are compounded by the difficulty in readily quantifying adaptation into benefits. Companies inherent concern about profitability makes them cautious about investing in climate adaptation measures that may be insufficient if regulation changes. Yet companies, particularly environmentally sensitive firms, will implement climate adaptation measures if they have first-hand negative experience of direct physical impacts (e.g., property damage due to flooding). This suggests companies systematically implement climate measures if they ensure adequate compliance and tick boxes to minimise regulatory risks.

Fourthly, the relationship between climate reporting and taking action also depends on sector characteristics. While the aforementioned factors influence all companies it was found that some are more influential than others because of their relationship with society, the environment, and regulation. In particular it was found that companies are more likely to implement climate measures if:

a) They are particularly sensitive to physical impacts because they either rely on specific weather and climate conditions to operate (e.g., Tourism), depend on the availability of climate-sensitive resources (e.g., Water), or have an extensive network of long-lived infrastructure and assets in climate-sensitive areas (e.g., Energy);
b) They are able to make considerable financial savings by reducing emissions because of their energy intensity (e.g., Energy, Extractive);
c) They are particularly responsive to social pressures because brand loyalty is an important component of corporate value and their social licence to operate (e.g., Energy, Extractive, Financial, Water). Operations or activities that negatively impact the natural environment may be used by socially and environmentally conscious stakeholders to hold them accountable for the non-regulated conditions of their company;
d) They are subject to independent economic regulation (e.g., Water, Energy), which has made climate change and the economic costs of action an established component of their business strategy planning.

8.5 Contributions to knowledge

The findings of this research not only provide insights on how the UK is progressing towards its climate change targets but also extend understandings of corporate governance and reporting practice. Contributions to knowledge are made to three research domains: a) organisational management, b) regulation and policymaking, and c) corporate non-financial reporting. Specific details of these contributions to knowledge are explained hereafter.

8.5.1 Organisational management

The study's first set of contributions to knowledge is to the domain of organisational management. The study is one of few to investigate how and why different types of climate reporting (e.g., carbon reporting and adaptation reporting) impact organisational culture and behaviour. Research findings indicate that the three organisational reporting perspectives identified in the literature as influencing other forms of non-financial reporting also affect climate reporting, albeit in a slightly different manner. As a result, the study expands existing understanding of different theories of organisational management by showing how three organisational reporting perspectives—ecological modernisation, greenwashing, and audit culture—work in practice and what their limitations are when applied to corporate climate reporting.

In regard to the concept of ecological modernisation, the literature suggests that protection of the environment will yield positive outcomes for the firm and the so-called 'triple bottom line' (Hajer, 1993; 1995; Spaargaren and Mol, 1992; Gibbs, 2000; Gouldson et al., 2008; Mol et al., 2009). In this perspective a company engages in climate reporting for the economic benefits it receives from moves towards environmentalism (e.g., reporting and implementing climate action). The

study's findings support this basic rationale. Some companies do indeed engage in climate reporting for its potential win-win economic outcomes. However, findings question the simplicity of the decision-making process that is postulated by ecological modernisation theory. The theory assumes that a company will take action when a potential economic benefit is identified from reporting. However, this study found this does not always happen. A company does not simply take action if reporting identifies economic benefits. Instead, for action to occur a company must also consider that the potential economic benefit is sufficiently clear, tangible and certain to justify the effort. Typically this meant implemented action(s) should lead to an immediate economic gain. Action with longer term horizons was relatively rare.

The degree to which eco-modernist thinking was a primary driver is shown to depend on the business sector and type of climate reporting (e.g., carbon reporting or adaptation reporting). Certain business sectors were found to be more suited to eco-modernism than others. Specifically, eco-modernism was more common in companies that can generate a large economic return from climate action. For instance, energy intensive firms enjoy greater returns than non-energy intensive firm from implementing energy efficiency measures to reduce their emissions; and consequently were more likely to seize opportunities for savings on energy expenditure and carbon taxes than non-energy intensive firms. Likewise, one type of climate reporting is more conducive to eco-modernism than the other because its style and format align closely to common business language used in decision-making. Specifically, carbon reporting lends itself to eco-modernism because emissions and the measures implemented to reduce these can be monitored and managed in quantitative terms, whereas adaptation reporting and climate adaptation measures are more difficult to translate into the kind of quantitative cost-benefit terms familiar to business decision-making. Consequently, the study indicates ecological modernisation theory is more context specific than currently acknowledged. For corporate responses to climate change the strength of ecological modernisation depends on company characteristics and the type of climate reporting.

In regard to the concept of greenwashing, the literature argues companies place more emphasis on reporting (e.g., signalling and claiming to be green) than actually implementing measures to minimise environmental impact (Deegan *et al.*, 2002; O'Dwyer, 2002; Laufer, 2003; Vos, 2009; Lyon and Maxwell, 2011; Mahoney *et al.*, 2012). In this perspective companies engage climate reporting to enhance their reputations and consequently make minimal commitments to meaningful action. The study's findings contest the premise that greenwashing is all about covering up poor performance and bad practice though clever reporting. Certainly there are instances of some companies doing just that, whereby a company is more concerned about presenting itself through reporting as doing more than they actually are. However, it was also found that some of the climate reporting with symptoms of greenwashing did not occur due to traditional reasons. Certain companies engaged in the kind of strategic reporting associated with greenwashing in order to avoid what they perceive as unfair repercussions to their business performance from the failure of interested parties to correctly understand disclosed information. Whereas carbon reporting is familiar to most interested parties

(and relatively easy to learn and understand), the nuances surrounding climate science (e.g., uncertainty), society's lack of familiarity with climate adaptation data, and adaptation reporting's tendency to carry negative undertones (i.e., potential bad news) means adaptation reporting is a greater risk to do. Moreover, with adaptation reporting the only savings available (to business) is the possibility of avoiding losses, whilst carbon reporting offers possible gains. As a result, adaptation data is often communicated in a way that resembles greenwash to knowledgeable interested parties. This suggests a need to improve society's understanding of contemporary environmental issues and the policies that aim to tackle them.

In regard to the concept of audit culture, the literature argues that corporate environmental action is driven by performative demands whereby companies participate for the sake of it rather than for any other substantive goal (Power, 1994; 1997; Shore and Wright, 1999; Humphrey and Owen, 2000; Power, 2003; Hodkinson, 2008; Shore, 2008). In this perspective companies do climate reporting in order to demonstrate their compliance with mandatory requirements and wider social norms, as well as mirroring the reporting behaviour of competitors. The study's findings indicate these audit tendencies exist in both types of climate reporting, whereby many companies only submit data to comply with the MCR and/or ARP.

Notably though, an audit culture emerges for different reasons in the two types of climate reporting. In carbon reporting the frequency in which firms have to report and the familiarity of all this reporting (i.e., different carbon reporting requirements collect similar data) pushes firms towards audit behaviour. Due to the familiarity between reports a company is unintentionally discouraged to think innovatively (e.g., identify new opportunities to reduce emissions). That is, if a company's current practice is readily meeting the requirements of multiple reports then it is less burdensome and more logical to keep business practice the same. This perspective is further compounded by the frequency of reporting. With companies unanimously demonstrating a clear desire to be compliant first, the high reporting frequency does not create conditions that encourage or allow a company to spend long-periods of time reviewing their practice and identify new opportunities. Time constraints (caused by reporting frequency) limit capacity to do anything other than report. By contrast, in adaptation reporting uncertainty, complexity, and the planning horizon complicate the reporting practice for many companies that do not have the in-house expertise to take ownership for ensuring they respond in accordance to regulation. Consequently, many companies seek to simplify their reporting practice by contracting out adaptation reporting to consultants that will help inform knowledge gaps and ensure they fulfil the reporting requirement. This, in regard to corporate responses to the ARP, led to the majority of companies producing similar, if not the same, reports. Equally though, audit emerged—whereby companies rarely took action post-reporting—because it is not required.

The prevalence of audit has potential repercussions for the UK's ability to meet emission reduction targets and build adaptive capacity and climate resiliency. Cutting business emissions is vital to meet reduction targets. If companies only do what is required, then it follows that

government will need to require more than just reporting, if it wants business to take action to meets its ambitious targets. Equally audit may lead to maladaption and UK vulnerability as companies focus more on ticking a box than preparing for potential climate change impacts.

8.5.2 Regulation and policymaking

The study's second set of contributions to knowledge is to the domain of regulation and policymaking. The study is one of few to critique the practical application of nudge theory as a mode of governance through reporting requirements. Nudge theory emerged from behavioural science, political theory and economics and argues that positive reinforcement and indirect suggestions to alter the attitudes, incentives, choice architectures, and decision-making of regulatees provides a more efficient means of achieving non-forced compliance than direct instruction, legislation, or enforcement (Thaler and Sunstein, 2008; Shove, 2012). The study's findings contest this argument, instead indicating, "nudging alone is not an effective strategy for changing behaviour on the kind of scale needed to solve society's ills" (Goodwin, 2012, p.86). In particular, nudging through reporting and disclosure requirements was found to not be a universally effective approach to changing climate behaviour by firms. Whilst nudging got companies to report and engage with an issue, it did not consistently get companies to take responsibility for their actions or indeed take much action at all beyond business as usual. Relying on the very act of reporting as the only mechanism to promote awareness and prompt climate action is not enough.

This challenges the assumption that getting companies to report will be enough to stimulate action. Large corporates will not just change behaviour because reporting has raised their awareness about potential benefits from acting. They need additional and stronger nudges to implement climate measures that are often costly or carry uncertain. Despite the benefits of reporting and taking action, the nudging employed in the MCR and ARP is not strong enough to alter the incentive structure of most companies. The consequence of this finding suggests the use of nudge as a mode of governance to encourage behavioural change in large corporates will not delivery meaningful action on complex social and environmental issues like climate change. Unlike individuals that can be nudged into behavioural change with some new information because their actions are part of a wider bundle of sedimented and largely unreflexive behaviour (Thaler and Sunstein, 2008; Shove, 2012), companies are ruthless calculators and have complex decision-making processes that act like barriers and to nudges.

In addition, the study demonstrated that companies will seek to comply first and then work out what comes next. Although "mandatory reporting is often seen as desirable within the social/environmental accounting and reporting literature" (Stubbs *et al.*, 2012, p.465), in practice statutes encourage an audit culture where companies aim to make themselves compliant and accountable first and then if conditions permit take action second. The problem with an audit culture is it "contributes to a weak, instrumental understanding of sustainability" (Stubbs *et al.*, 2012, p.465) which hinders progress towards a sustainable future.

This insight has important implications for the application of network-based forms of governance to get companies to take action (Jessop, 2013). Whilst the existence of a statutory duty from Government is by itself a strong motivator to get companies to engage in contemporary social and environmental issues and does help raise awareness, relying upon the principles of nudge (alone) to facilitate action is not sufficient. Though reputational risks can affect business performance, this threat is not strong enough to overcome corporate desires to protect profitability. When action is more costly than beneficial, companies will not act. On the other hand financial risks (e.g., penalties or taxes) do encourage companies to act more readily because it directly affects profit margins. Thus it is not enough to just nudge companies into proper action. There is no real sense to go beyond compliance reporting. This suggests regulation for contemporary social and environmental issues should be accompanied by strong state regulation on action—and enforcement of regulations—to ensure compliance.

This reiterates the challenges of policymaking and in particular of developing regulation to encourage behavioural change to social and environmental issues. Whilst reporting requirements can get companies to start thinking about and engaging with an issue, the characteristics of regulation (e.g., strength, mode of governance) shape the degree to which companies take the next step and engage in proactive and innovative behaviour (Eberlein and Matten, 2009). If too stringent or familiar to other obligations, regulation can stifle innovation as companies decide to take less risky strategies. Yet conversely a stringent regulatory framework will encourage some companies to take strategic proactive choices as they realise they have to take action. At the same time, the lack of a coherent and consistent regulatory framework fosters uncertainty in business that encourages a wait-and-see approach (Eberlein and Matten, 2009; Boiral *et al.*, 2011). Consequently, this suggests a one-size fits all approach to regulation is less likely to work for tackling complex environmental issues.

Indeed, the climate regulation investigated in this study (e.g., MCR and ARP) appears to overlook the nuances of its stakeholders it aims to govern. As a consequence, climate regulation perhaps needs to become more aligned to corporate practice. Given the findings of this study climate regulation arguably needs to develop a more sector-specific approach that focuses on regulating different sectoral characteristics that influence organisational culture and behaviour. For instance, to regulate emissions of energy intensive firms, regulation could focus on the economic value of reducing emissions, for example through carbon taxes or a stricter carbon permit regime. Conversely to regulate emissions of non-energy intensive firms regulation could focus on the reputational repercussions of not matching competitor's activities, such as through labelling and transparency requirements or kite mark schemes.

The study's findings also inform practical knowledge of the regulatory approaches for carbon and adaptation currently employed. To continue driving emission reductions and avoid audit-like behaviour different carbon-focused mandatory reporting requirements could be consolidated together. The same could occur for voluntary indexes, which typically collect the same data.

Reducing the number and variety of carbon reports a company has to file may reduce administrative burden and free up money and time to identify and then implement climate mitigation measures.

To enhance the rate of adaptive capacity building and avoid audit-like behaviour, adaptation-focused mandatory reporting requirements need to become more frequent and consistent over a prolonged period of time. Frequent reporting and consistency in what is reported may help address some of the barriers to climate adaptation such as a company's concern about the potential impacts changes in regulation have on the costs of actions. In addition, regulation needs to be accompanied with a suite of useful, usable and actionable information that will inform corporate decision-making. In particular, this information will need to clearly spell-out the differences and similarities between climate adaptation and risk management and the benefits of doing both; as well as the importance of considering interdependency climate risks.

8.5.3 Corporate non-financial reporting

The study's final set of contributions to knowledge is to the domain of corporate non-financial reporting. The study's findings not only mirror those of previous research on corporate non-financial reporting—that reporting and action are driven by perceived economic benefits, social opportunities and regulatory requirements—but also extend existing knowledge by showing how corporate responses are influenced by different sectoral characteristics, as well as corporate expertise. For instance environmentally sensitive firms are more likely to engage climate adaptation because they have a stronger history and expertise in coping with sensitive environmental conditions that present business risks.

The findings of this study demonstrate the fine balance between social equity, economic efficiency, and environmental sustainability in corporate environmental management. Without question there is a broad willingness by major corporates to undertake actions when the immediate benefits exceed the direct and indirect costs of doing so (Meek *et al.*, 1995). In the context of this study, climate mitigation is widely undertaken because it may protect near-term profitability, whereas climate adaptation is sparingly undertaken because its connections to profitability are uncertain or remote in time. Although climate actions may be beneficial in the long-term, companies decisionmaking is strongly influenced by the immediacy and size of the benefit, and whether the right enabling factors exist to stimulate action. It is not enough to know there is a benefit from doing some environmental good. It needs to be significant. In this sense corporate environmental management appears to depend on certainty. This is further complicated by the notion that "there is a tendency to find decision-making difficult in situations of uncertainty and to favour short-term over long-term gains" (Kahneman, 2003). Contemporary social and environmental issues tend to not match corporate planning horizons.

In addition, the study also informs understanding of corporate carbon reporting and adaptation reporting. Specifically, for carbon reporting the study highlights reporting fatigue

because of over-regulation and the familiarity of different voluntary reporting indexes to one another. The consequence of which has led to an audit-like response from companies to carbon reporting requirements that may have potentially stalled innovative thinking to reduce emissions as companies become increasingly focused on reporting.

For adaptation reporting the study supports arguments that climate adaptation is perceived to be the same (if not very similar) to risk management (Berkhout *et al.*, 2006; Hultman *et al.*, 2010; Weinhofer and Busch, 2013; Wise *et al.*, 2014; Gasbarro and Pinkse, 2015). However, unlike previous research the study's findings indicate that this similarity can be a barrier to action (i.e., implementation of climate adaptation), as well as a reason for not reporting on adaptation specifically. Whereas most companies fail to recognise the differences between the two practices because of a lack of climate adaptation expertise, some companies (particularly environmentally sensitive firms) do not believe reporting on climate adaptation should be separated from risk management because of their similarity. For these companies both practices are supportive of one another and cover many of the same issues. Therefore, they perceive there is little or do not recognise the value in reporting separately. Arguably this finding points towards maladaptation within the UK business community. This is because companies are not necessarily thinking enough about the long-term or specific impacts associated with climate change. Consequently, additional research is required to understand more fully the relative importance of different drivers of both corporate adaptation reporting practice and corporate risk management practice in order to determine whether businesses are building sufficient adaptive capacity through existing means. That is, whether current corporate risk management meets the standards required for climate adaptation.

8.6 Limitations of the Study and Future Research

The study is not without its limitations. These, combined with the findings of the research, present a number of potential avenues for future research.

One limitation in the study is the sample. While the number of companies sampled per case-study sector might have been increased to ensure representativeness, this is probably not as high a priority as increasing the number and variety of interviewees per company to strengthen insights about the internal dynamics of climate reporting (i.e., firm specific characteristics that affect organisational culture and behaviour) and its relationship to action in large complex organisations. In addition, the number of case-study sectors could be increased to develop a more complete picture for the business community. Notably, the low number of interviewees per company raises questions about the strength of triangulation employed; which in turn demonstrates the difficulty in applying a comprehensive critical realist approach that truly guides social inquiry to look beyond appearances and uncover the hidden structures that generate them (Bhaskar, 1975; 1998; Dobson, 2001; Dobson *et al.*, 2007; Bygstad and Munkvold, 2011; Wynn Jr and Williams, 2012).

To that end, a simple extension to the research would be to apply the same conceptual model developed here in other sectors, making sure to sample more companies per sector and more

interviewees per company. Moreover, while the qualitative approach helped shed light on an unexplored research field, the casual relationships identified in Figure 6-1 and Figure 7-1 in Chapter 6 and 7, respectively, could be usefully tested through further research, which might use more quantitative methods to explore how well they hold up internationally.

This points to another limitation of the study – its sole focus on the UK and its particular regulatory, reputational, and economic environment. Although many of the companies sampled are multinational corporations with infrastructure and assets in other countries that will be subject to similar factors, regulatory reporting requirements and hence corporate responses to them may well differ internationally (WRI, 2012). Although interview participants were encouraged to talk about the overall organisational culture and behaviour, it cannot go unnoticed that because the study only spoke to employees based in the UK there was a tendency to talk about UK factors. Therefore, another avenue for additional research would be to investigate how the factors identified in this study—regulatory, reputational, and economic environments—affect the business performance of the same multinational companies in other countries. Physical risks are distributed differently across the globe, which has many implications for multinationals and the markets in which they operate. For instance, insurance will be different. Alternatively, utilising the same conceptual model developed here, it would be useful to investigate whether business companies from other developed and developing countries experience the same dynamics. This would help to determine if many of the issues identified are either UK specific or global issues, or are due to the industrialised status of the country in which a company operates.

Notably, only a couple of studies have been carried out on small and medium-sized enterprises (SMEs) that have looked at similar issues (Pelling *et al.*, 2008; Beerman, 2011). SMEs form an important segment in a society, even though their emissions contribution is relatively minor in comparison to multinational corporations. Nevertheless how they react to climate change has important implications, especially for the communities in their immediate vicinity. Furthermore, company size is likely to be an important determinant on disclosure. "Larger companies are likely to have more financial and human resources that enable them to base their strategy on several simulations measures, whereas smaller companies may have to be more selective in the choice of the measures they take" (Weinhofer and Hoffman, 2010, p.81). Thus there is a whole set of scale factors that can be explored.

Finally, the timing of the study is a limitation. In particular, data collection of the empirical research was conducted very soon after the MCR was established. Although this captured the immediate reaction of companies to the MCR, it is possible that the MCR will have a greater influence on organisational culture and behaviour in the course of time. Corporate responses are likely to evolve in the medium- to long-term as they become more familiar with the reporting requirement, and the carbon reporting landscape changes. Consequently, there is an opportunity to conduct a longitudinal study that re-examines MCR reporting in the same set of sampled companies

to determine if corporate responses and the MCR's impact evolve. Notably, to date very few studies have been performed.

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Appendix A: List of Sampled Companies

Sectors classifications are based on a combination of those used by CDP[63], Defra[64], and the London Stock Exchange's FTSE 100 Index[65]. Companies in the FTSE 100 were selected as of July 1, 2013.

		Name of Company
Sector	***Consumer discretionary*** *(Includes companies that provide nonessential goods and services, includes: auto components, hotels, restaurants and leisure, media, multiline and speciality retail, and textiles, apparel and luxury goods)*	BSkyB Burberry Group Carnival Compass Group Easy Jet GKN Plc InterContinental Hotels Group International Consolidated Airlines Group ITV plc Kingfisher plc Marks and Spencer plc Next Plc Pearson PLC RELX Group Rexam PLC Sports Direct International plc Tui Travel PLC Whitbread PLC William Hill plc WPP plc
	Consumer staple *(Includes companies that provide essential goods and services that people are unable or unwilling to lose, includes: beverages, food products, household products, and tobacco)*	Associated British Foods plc British American Tobacco plc Coca-Cola Diageo plc Imperial Tobacco Group plc J Sainsbury plc Persimmon plc Reckitt Benckiser Group plc SABMiller plc Tate & Lyle plc Tesco PLC Unilever PLC Wm Morrison Supermarkets plc

[63] CDP. 2012. Insights into Climate Change Adaptation by UK Companies. *[Online]* Available at: https://www.cdp.net/CDPResults/insights-into-climate-change-adaptation-by-uk-companies.pdf, [Accessed April 19, 2012].

[64] Defra, 2009. *Adapting to Climate Change: Ensuring Progress in Key Sectors. 2009 Strategy for exercising the Adaptation Reporting Power and list of priority reporting authorities*. London: Department of Food and Rural Affairs, pp.44.

[65] FTSE sectors classifications as summarised on http://shares.telegraph.co.uk/sectors/

Energy utility *(Includes electricity generators, transmitters and distributors as well as gas transporters and distributers)*	Centrica plc Drax Power E.ON UK EDF Energy PLC Electricity North West ES Pipelines Limited GTC Pipelines Independent Pipelines Intergen International Power National Grid plc Northern Gas & Power Limited Northern Powergrid Holdings Company Ovo Energy RWE npower plc Scotia Gas Networks ScottishPower Ltd. SP Energy Network *SSE plc* UK Power Networks Wales and West Utilities Western Power Distribution
Extractive *(Includes companies involved in mining, oil and gas, as well as providing extractive equipment and services)*	Amec Foster Wheeler plc Anglo American Plc Antofagasta PLC BG Group plc BHP Billiton BP plc CRH Group Croda International plc Eurasia Mining Plc EVRAZ plc Fresnillo plc Glencore Xstrata plc Johnson Matthey Kazakhmys PLC Mondi plc Petrofac Services Ltd Polymetal International plc Randgold Resources Rio Tinto Group Royal Dutch Shell plc Tullow Oil plc Vedanta Resources plc

Financial service *(Includes commercial banks, insurance, capital markets, and real estate investment trusts)*	Aberdeen Asset Management PLC Admiral Group plc Ashmore Group plc Aviva plc Barclays Bank PLC British Land Company plc Intu Properties plc Friends Life Group Limited Hammerson plc Hargreaves Lansdown plc HSBC Holdings UK plc ICAP plc Land Securities Group plc Legal & General Plc Lloyds Banking Group plc Man Group plc Old Mutual plc Prudential plc Resolution plc Royal Bank of Scotland plc RSA Insurance Group plc Schroders plc St. James's Place plc Standard Chartered PLC Standard Life plc
Healthcare *(Includes pharmaceuticals, and healthcare equipment and supplies)*	Abcam plc Alliance Pharma plc AstraZeneca plc GlaxoSmithKline plc Hikma Pharmaceuticals PLC Shire Plc Smith & Nephew PLC Vectura Group plc

Industrial *(Includes airlines, aerospance and defense, commercial services and supplies, industrial conglomerates, machinery, professional services, and trading companies and distributors)*	Aggreko UK Ltd Babcock International Group plc BAE Systems plc Bunzl plc Capita Group PLC Experian plc G4S plc IMI plc Intertek Group PLC Meggitt PLC Melrose Plc Rolls-Royce Holdings plc Serco Group plc Smiths Group plc Travis Perkins plc Veolia Environmental Services Weir Group plc Wolseley plc
Information technology *(Includes companies involved in software, and semiconductors and semiconductors equipment)*	Acer Inc. ARM Holdings plc CSR PLC Sage Group plc Samsung Electronics Co., Ltd.
Telecommunication *(Includes networked IT services, local, national and international telecommunications services, and higher value broadband and internet products and services)*	BT Group plc O2 Talk Talk Telecom Group plc Vodafone Group plc

Transport *(Includes organisations responsible for road, rail, air and ports)*	Associated British Ports Holdings Ltd Birmingham airport Cardiff Airport Dover Harbour Board Edinburgh Airport Eurotunnel Group Felixstowe Docks and Harbour Company Gatwick Airport Glasgow Airport Harwich Haven Heathrow Airport London Stansted Luton Airport Manchester Airport Groups Mersey Docks and Harbour Company Milford Haven Network Rail PD Teesport Port of London Port of Sheerness
Water *(Includes companies responsible for delivering water and wastewater services)*	Anglian Water Bristol Water Cambridge Water Company PLC Dee Valley Water plc Northumbrian Water Group plc Portsmouth Water Ltd Semcorp Bournemouth Water Ltd Severn Trent Water plc South East Water Ltd South Staffordshire Water PLC South West Water Ltd Southern Water Services Ltd Sutton and East Surrey Water PLC Thames Water Utilities Ltd United Utilities Group PLC Veolia Water UK Welsh Water Wessex Water Services Ltd Yorkshire Water Services

Appendix B: Information Sheet for Participants and Consent Form

Information Sheet for Participants

REC Reference Number: ***REP(GSSHM)/12/13-13***

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Title of study: Corporate Responses to Climate Change Reporting Requirements in the UK

We would like to invite you to participate in this postgraduate PhD research project. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information (contact details at the bottom of the sheet).

The study aims to provide a deeper and more useful understanding of corporate environmental reporting with a particular focus on the practice of climate change reporting and its effects on organisational cultures and behaviours. The principal objectives are to determine: who is (or is not) reporting on climate change; how are they reporting; why are they reporting; and, what is the impact of reporting on corporate responses to climate change?

The benefit of such research is threefold. Firstly it will inform whether, how and why the UK business community is reporting or not reporting on climate change. Secondly, it will add a degree of governance and assistance to individuals with climate change policymaking responsibilities. And thirdly, in a wider context, outcomes will inform where vulnerabilities and resilience exist in the UK's strategy and capacity to adjust and manage climate change.

Your contribution to the research will be in the form of participating in an interview, which will take no longer than an hour. By participating, you will provide invaluable insight into the current reporting process (planning and implementation) by responding to questions on why you (the organisation you are representing) choose to or not to report, how they report, what information is utilised, and what and why response actions are undertaken post report publication. With your permission, interviews will be recorded and transcribed to aid analysis.

Your confidentiality is very important. No sensitive personal data will be recorded, with all research data encrypted and stored in accordance with the Data Protection Act 1998. Collected data will be given a unique identification code for analysis. Your name and the name of the organisation you represent will not be used directly, and any data used in the final report will appear in an anonymised form unless prior consent is given. Upon dissemination and publication of the final report raw anonymised data may have to be made available to other researchers for peer review purposes. It is important to note here that the research is funded by the Economic and Social Research Council (ESRC). As an ESRC award holder, the research must be made available to the public through the ESRC Social Science Repository and the UK Data Archive via the Economic and Social Data Service. All data supplied will remain anonymised.

It is up to you to decide whether to take part or not. If you decide to participate, you may withdraw any information immediately without giving a reason up until July 1st 2014. A decision to withdraw, or a decision not to take part, will not affect the standard of care you receive. Notably, in the event of producing article papers from the research for journal publication, data will be kept indefinitely to abide by the requirements of publishers and journals.

If you have any questions or require more information about this study, please contact the 'Principal Investigator' (details below). If this study has harmed you in any way you can contact King's College London's 'Supervisor' for further advice and information (details below).

Principal Investigator: Samuel Tang
T: +44 (0) 20 7848 1054 **: E:** samuel.tang@kcl.ac.uk
Supervisor: Professor David Demeritt
E: david.demeritt@kcl.ac.uk
Address: Department of Geography, King's College London, Strand Campus, London WC2R 2LS, UK

CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: Corporate Responses to Climate Change Reporting Requirements in the UK

King's College Research Ethics Committee Ref: *REP(GSSHM)/12/13-13*

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

Please tick or initial

- **I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and withdraw from it immediately without giving any reason. Furthermore, I understand that I will be able to withdraw my data up until July 1st 2014.** ☐
- **I understand that due to the research being funded by the Economic and Social Research Council (ESRC), the final research data should be made available to the public by submitting it to the ESRC Social Science Repository and the UK Data Archive via the Economic and Social Data Service.** ☐
- **I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the Data Protection Act 1998.** ☐
- **I consent to my interview being recorded.** ☐

Participant's Statement:

I _____

agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information Sheet about the project, and understand what the research study involves.

Signed **Date**

Investigator's Statement:

I _____

confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the participant.

Signed **Date**

Appendix C: Interview Topic Guide

Introduction

- Introduce researcher and the research.
- Explain the interview will last a maximum of one hour.
- Participation is optional and they can stop the interview or decline to answer specific individual questions at any time should they wish.

Confidentiality and consent

- Explain that the findings will be written up and published.
- Any views and quotes used in the report will be combined with views and quotes from other interviews and their name and organisation's name will not be used (nor will anything else that could identify them).
- Ask if they are comfortable with the interview being recorded to help capture what is exactly said.
- Ask them to verbally confirm that they understand the purpose and confidentiality of the research and that they are happy to take part.
- Ask if they have any questions.

1. Background on interviewee and company represented

1.1 Please describe the main responsibilities of your job and how long you have been in your current position.

1.2 Where does your team or business function sit within the Group's corporate structure?

2. Understand the company's general approach to non-financial reporting

2.1 What are the principal social and environmental issues your organisation monitor? Why? When did this practice begin?

2.2 How does the organisation address these issues? (e.g., who is responsible—central/devolved)

2.3 Is performance information disclosed internally and externally? How? What are the main differences?

2.4 Where did this agenda to report externally come from? (e.g., investors, board, shareholders, civil society, regulators, Government, peers) When did it begin?

3. Distinguish the company's climate change perspective

3.1 What does climate change mean to your organisation? (e.g., a concern? principal risks and opportunities?)

3.2 What has influenced your organisations climate change agenda? (e.g., investors, board, shareholders, civil society, regulators, Government, peers)

3.3 How does the organisation address climate change? (e.g., who is responsible—central/devolved; Do you monitor performance? How? Why?)

4. Probe the company's practice of climate reporting

4.1 Describe the process of how the organisation identifies climate risks and opportunities? (e.g., who is responsible—central/devolved; climate science; third-party verification; external specialists or consultants; workload; cost)

4.2 What kind of climate change reporting do you do? (e.g., mandatory and voluntary; short-/long-term; carbon/adaptation; business continuity)

4.3 What information is disclosed (and not)? Why?

4.4 What influences these practices of climate change reporting? (e.g., investors, board, shareholders, civil society, regulators, Government, peers)
4.5 How often is reporting performed?

5. Determine to what end reporting serves

5.1 What is the value of all this generated climate change information?
5.2 How do you use this climate information externally? (e.g., where is it disclosed? Why? Intended audience?)
5.3 How do you use this climate information internally? (e.g., climate mitigation/adaptation decision-making processes? Why?; Do you monitor climate performance?; Climate target-setting for the entire company and business functions?; internal organisational dynamics)
5.4 What role does climate information play in the company's overall corporate strategy?